MARCH 1958

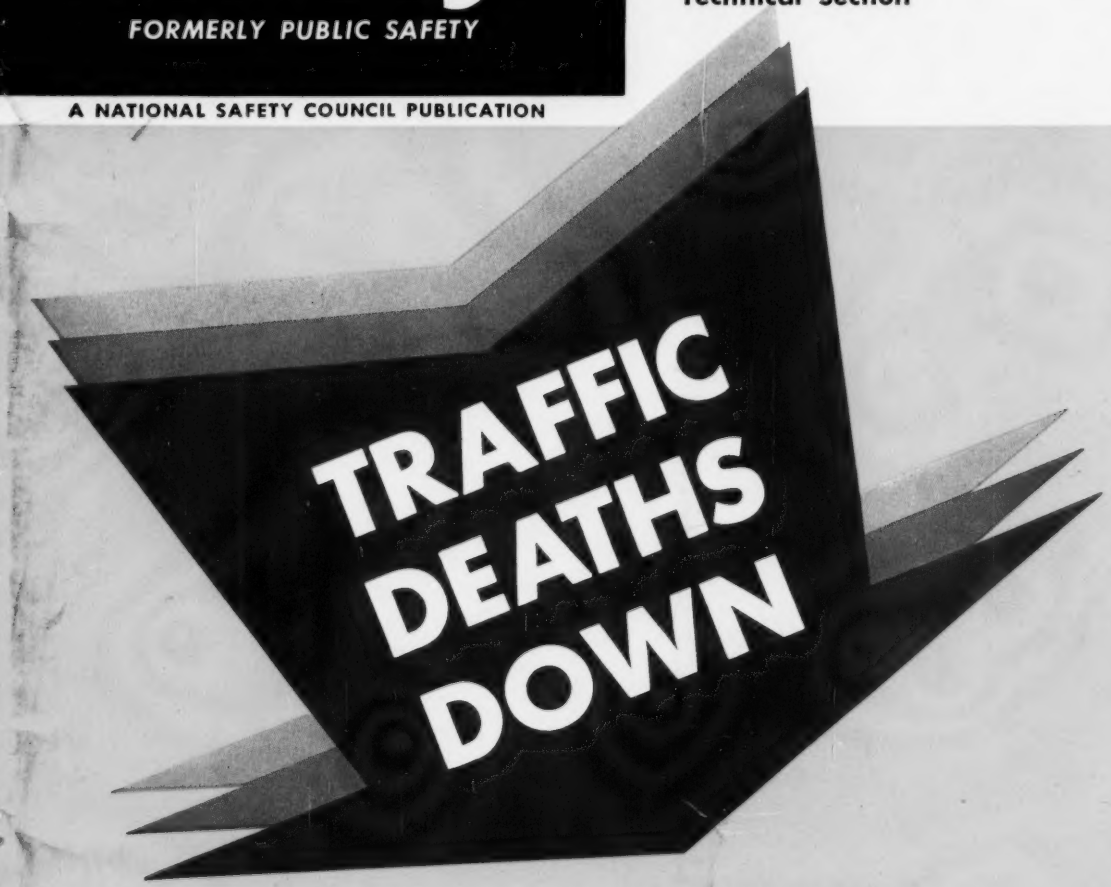
Traffic Safety

FORMERLY PUBLIC SAFETY

QUARTERLY RESEARCH REVIEW

Technical Section

A NATIONAL SAFETY COUNCIL PUBLICATION



WHERE the lives were saved

Also in this issue: ***What do we know about***

SCHOOL BUS ACCIDENTS?

General Motors

launches a vital new program to make America's highways safer after dark

IF NIGHT DRIVING could be made as safe as *daytime* driving, mile for mile, some 15,000 lives could be saved every year. I am sure that you, as an active participant in America's safety effort, will share my enthusiasm concerning the progress that can be made in this most important area.

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This is an educational job of great magnitude—reaching every American motorist, explaining the problem and urging him to action. Yet there is good reason to believe that through our concerted efforts, a significant increase in highway safety after dark *can* be achieved. I earnestly hope that you will join me, in every way that you can, in helping to make the AIM TO LIVE program a success.

Harlow H. Curtice

PRESIDENT

FOR FURTHER INFORMATION WRITE "AIM TO LIVE", 11-226 GENERAL MOTORS BUILDING, DETROIT 2, MICHIGAN

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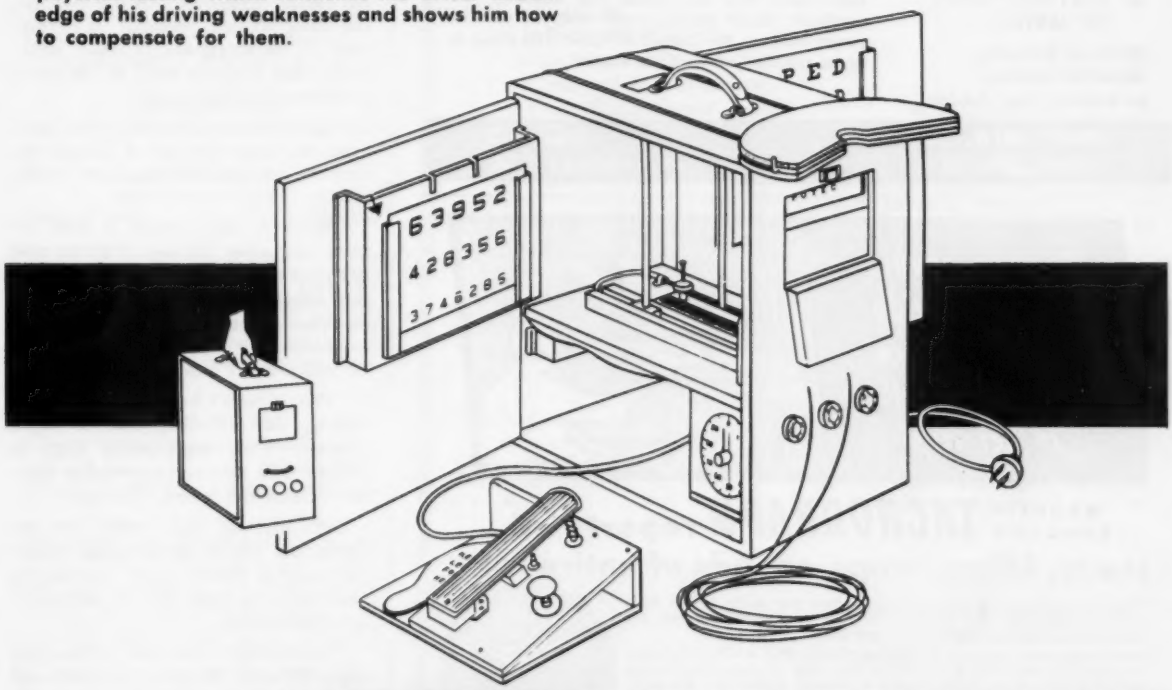

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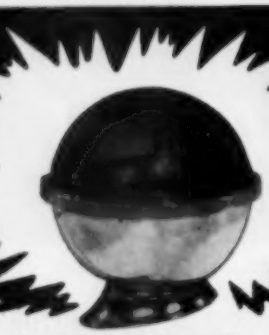

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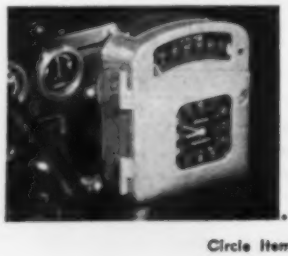

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Behavior Research Urged by Hufstader

William F. Hufstader, vice president of General Motors, urges a "greatly expanded program of basic research" into the causes and remedies of traffic accidents.

Such inquiry, he says, should include not only the technical aspects of traffic safety but also "human attitudes and behaviors" which are an even more critical part of our accident problem.

Mr. Hufstader, who is vice president in charge of GM's distribution staff, expressed these views at the annual dinner meeting of the Greater Lansing Safety Council in January.

In addition to more research and development work directed at technical progress, he said, there is need for clearer recognition of the fact that the traffic accident problem "is a symptom . . . of moral and behavior weaknesses that underlie most of the social problems confronting us.

"This does not mean," he said, "that we must develop a Utopia before we can achieve maximum traffic safety.

"What it does mean is that we must recognize human attitudes and behavior as the key factors demanding our attention. And we must recognize that these factors cannot be successfully dealt with by trick solutions or half-hearted measures."

"People won't be scared into good driving, nor will they react to vague appeals. They must really want to behave in a mature, responsible manner behind the wheel," he said.

Similarly, he said, traffic law enforcement will achieve its full potential only if based on a "thoroughly realistic" appraisal of its objectives and capabilities.

"Enforcement has not been fully effective only because we have not employed it as fully and as soundly as we should, in recognition of antisocial behavior as a major cause of traffic accidents," Mr. Hufstader said.

Such research into human behavior and technical causes of accidents would have to be organized on a national basis, utilizing the resources of national safety organizations, universities and other research agencies, he said.

Traffic Safety

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TRAFFIC SAFETY is dedicated to the prevention of traffic accidents through the presentation of objective information and responsible opinion to official agencies, public support groups and the motor transportation industry. The views expressed do not necessarily reflect the beliefs or policies of the National Safety Council, but they are presented in the conviction that the pressing social problem of traffic accidents can best be resolved through freedom of expression and open debate.

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IN THIS ISSUE:

Traffic Operations:

Accidents—Big Hospital Headache 4
1957 Traffic Toll Down—Death Rate at All-Time Low . . . 7
The National Accident Fatality Toll 12
Chicago's Holiday Gift 13
Hammond Curbs Pedestrians . . . . . *Lawrence Hoffman* 16
How to Drive on Snow and Ice 18
Fort Wayne Lights a Risky Interchange . . . *J. H. Hinman* 20
Nine of Ten Drivers Rate Themselves Above Average . . . 22
Yale Points Up Future for Traffic Engineers 25
Slough—Britain's Safety Town . . . . *Ernest C. Thompson* 26

Public Support:

How Railroads Back the Attack on Traffic Accidents . . . . . *Jack C. Trimble* 32
How Trumbull County Earned Safety Check Grand Award . . . *M. R. Darlington, Jr.* 34
Aim to Live! 36

Operation Safety:

Back the Attack With May Vehicle Maintenance Program . . 37
Local Conditions Dictate Vehicle Maintenance Program . . 38
Poor Vehicle Maintenance—Widespread Traffic Problem . . 44

Motor Transportation:

What Do We Know About School Bus Accidents? . . . . . *Hallie L. Myers* 48
Miami's Bus Clearance Gauge . . . . . *Patrick S. Sirois* 42

Research Review:

Quarterly Technical Section 65

Departments

Today's Traffic 5
Test Talk 23
Good Morning Judge 24
The Traffic Record 28
Program Aids 44
Operation Safety Materials 45
Fleet Posters 46
Safety Library 54
New Safety Equipment 60
Safety Product Literature 62
Coming Events 64

A GLANCE at the worker accident figures on page 12 of this issue ought to give pause to America's industrial leaders—32,300 workers killed off-the-job, more than 1,100,000 injured. And don't forget that the greater number of deaths and injuries were in traffic.

For the past decade, those charged with responsibility for traffic control and accident prevention have been imploring the industrial safety folk to join them in a concerted attack on traffic accidents. The Council's *Back the Attack on Traffic Accidents* campaign was designed to enlist their wholehearted assistance. While some of the more forward-looking industrial leaders have lent their aid to official and nonofficial agencies in this great crusade, the greater number haven't done their share of the work for the common good.

Business and industry can play a vital role in slashing the traffic toll. Let's hope the President's Regional Conferences can enlist their active aid and support.

ACCIDENTS—BIG HOSPITAL HEADACHE

Surveys show accidents account for seven per cent of all hospital cases—more than one-third of all "long stay cases"

WHAT is the burden imposed upon American hospitals and physicians by the steady stream of accident victims?

Two surveys, recently released by the American Medical Association and the Blue Cross, shed some light on the tremendous cost of accidents, in both time and money, to the nation's hospitals.

According to a nationwide survey made by the Bureau of Medical Economic Research of the A.M.A., accidents account for about 7 per cent of all cases treated in American hospitals. Accidents combined with pregnancy, the "other great non-disease category," account for about one-fourth of the total hospital load. The A.M.A. study was based on information about patients discharged from 6,000 general and special hospitals during November, 1955.

The Blue Cross study, conducted by the Indianapolis Blue Cross, indicated that accidents constitute more than a third of the "long stay cases" in hospitals. This study covered 880,000 Blue Cross members, more than 20 per cent of the population of the State of Indiana. Among these members, there were 129 cases of 100 or more consecutive days of hospitalization. Accidents accounted for 47 of these cases or 36.6 per cent. The highest case cost of the accident cases was $3,979.00 with an average cost for the entire 47 cases of $2,109.50.

Although neither study breaks down the figures into types of accidents involved, it might be surmised that traffic accidents play a major role as they are usually more severe and even minor injuries on the highway are more likely to receive hospital treatment.

In a future study, the Bureau of Medical Economic Research plans to look into the proportion of accident cases treated by physicians in the home and office.

A previous study of the Bureau, of considerable interest to those in safety work, showed that fatal accidents outrank heart disease (whose special victims are retired persons) as the No. 1 destroyer of the working years of life in the United States.

Here are the details on the current survey covering the accident load on the nation's hospitals. The data for patients discharged during November, 1955, indicate the following findings:

1. The 128,000 inpatients discharged who were hospitalized because of accidents comprised 6.9 per cent of all patients discharged during the month.

2. The total inpatient-days for these patients were 1,370,000, or 8.1 per cent of total inpatient-days for all inpatients discharged during the month; the average length of stay was longer —10.7 days versus 9.1 days—for accident inpatients.

3. Of the total inpatients discharged during the month who were hospitalized because of accidents, 65.2 per cent were males—11.3 per cent under 15 years of age, 35.6 per cent in the age group 15-44, 13.1 per cent in the age group 45-65, and 5.2 per cent, 65 years and over; and 34.8 per cent were females—5.8 per cent under 15 years of age, 12.4 per cent in the age group 15-44, 8.6 per cent in the age group 45-64, and 8 per cent, 65 years and over.

4. Although the term "emergency room" was subject to some misinterpretation, 31.8 per cent of all patients (out patients and inpatients) seen in emergency rooms were accounted for by accidents.

5. During the reporting year the care of accident patients required expenditures of 311 million dollars, or 7.4 per cent of the total annual expenses of the 6,000 general and special hospitals. (Presumably the total for 1957 involved many more millions of dollars.)

6. The annual payroll expense of these hospitals for the treatment of accident cases was 198 million dollars, or 7.3 per cent of the total payroll.

7. The personnel devoted to the care of accident cases totaled 68,200 or 6.7 percent of total personnel.

8. The accident cases required the use of 50,500 beds, or 6.7 per cent of the total beds.

ACCIDENTS ACCOUNT FOR 3 OUT of 10 EMERGENCY CASES

Toll turnpikes safest roads

The nation's toll turnpikes continue to be the safest roads in the country. Two of them—the Pennsylvania Turnpike and the New York Thruway—set new safety marks far below the national average of 5.9 fatalities per 100 million miles traveled in 1957.

The Penn Pike had a fatality rate of 3.3 and a fatal accident rate of 2.6 during 1957. Its previous record of 4.2 and 3.2 respectively was set in 1954. Last year there were 1,855,000,000 miles of travel on the road and 62 persons were killed in 48 fatal accidents. The Thruway cut its death toll to 1.94 with 33 deaths in 1,700,545,210 miles of travel. Its old mark of 2.44 was set in 1954, its first year. The new Indiana Toll Road reported a rate of 2.6 deaths last year, its first full year of operation.

Drivers cash in on retiming

It is estimated that the retiming and synchronization of Chicago traffic lights, completed last October, is saving motorists $315,000 per day. The signal adjustment, which involved 96 per cent of the city's 1,800 signals, has cut stops about 50 per cent for motorists who maintain their speed at posted limits.

Paris extends "Blue Zone"

The success of restricted parking in the so-called "Blue Zone" of Paris (*Today's Traffic*, January, 1958) has been so spectacular that the zone will be extended next month to the Saint-Lazare Railroad Station district, one of the busiest areas in the French capital.

A force of 237 policemen now checks up on the parking limit. In order to release the police officers, a special force of 56 men—mostly retired policemen—has been recruited to hand out tickets. This group will eventually be increased to 200. The 1,200 franc (about $3.50) fine is strictly enforced.

Emergency kits for night use

To reduce the hazard of cars parked for emergency repairs on congested streets, highways, and freeways, the California Junior Chambers of Commerce are offering emergency kits—containing two red flares, an instruction booklet and a red flag—to all California drivers.

Presidential commission for traffic?

Senator Monroney of Oklahoma says he intends to sponsor a bill creating a presidential commission to deal with traffic accidents. The senator believes the time has come for the Federal Government to try to reduce accidents by tying together all the scattered safety efforts now under way.

Some of the tasks he envisions for the commission are: establishment of a nationwide uniform system of accident reporting; recommendation of an

interstate drivers' license to be required of all motorists crossing state lines; drafting of uniform traffic codes and proposals for new safety design features for automobiles.

More de-icing salt used

Increased winter driving in the nation's ice and snow belt, combined with the national drive for highway safety, have pushed the volume of salt used in snow and ice control to a record figure of approximately 2,000,000 tons for the 1957-58 season. This is a 25 per cent increase over last season's usage by states and municipalities.

U.S. pedestrian well behaved

Dr. W. Linden, top German traffic safety expert who attended the 45th National Safety Congress in the U. S., credits the American pedestrian with being more disciplined and alert than the German walker. Writing in the monthly *Deutsche Verkehrswacht*, Dr. Linden notes that Americans place a higher value on human life than do Europeans, especially Germans.

Snow biggest problem

Snow is the biggest and costliest problem on the Indiana Toll Road. The annual budget for snow removal is $300,000—nearly $2,000 a mile. But, according to George Lutz, manager of operations, snow removal pays dividends in increased traffic. On the third day of a heavy snowfall last December, truck traffic showed a sharp rise. The truckers alone paid $12,000 that day for the privilege of driving on the only road in the area that was free of snow.

Moral approach stressed in Michigan

In Michigan emphasis is being placed on the moral approach to the traffic accident problem. Using the general theme, "In Traffic, Too, Your Church Says Practice Your Religion," churches throughout the state have reminded drivers and pedestrians of their responsibilities in traffic. A statewide Traffic Safety Sunday was observed by clergymen of the Protestant, Catholic, and Jewish faiths. Clergymen encouraged traffic safety through sermons, prayers, stories in church papers, and pulpit reminders.

Smogless exhaust

A catalytic muffler has successfully removed smog-forming compounds from an automobile exhaust on a 10,000-mile road test, according to John M. Campbell, chairman of the Automobile Manufacturers Association subcommittee on combustion products. Although the device looks hopeful, it is still far from developed.

Faulty light dead giveaway

Poor vehicle maintenance led to the downfall of a driver who had been barrelling along Connecticut roads for 26 years without a driver's license. One night a burned-out tail light on his car attracted an officer's attention. The officer stopped him, discovered his license-less state and took steps to correct it.

1957 TRAFFIC TOLL DOWN— DEATH RATE AT ALL-TIME LOW

Slash in Rural Deaths Makes the Difference

1957 traffic deaths number 38,500—down 3 per cent from 1956 toll. More than 1,350,000 persons injured in motor vehicle accidents as death rate hits all-time low of 5.9 (per 100 million miles). More than 66,400,000 registered vehicles rolled up in excess of 650 billion miles of travel. Data shows passenger cars used in 88 per cent of inter-city travel. Economic loss of traffic toll for 1957 hits $5,300,000,000—up 6 per cent over the cost figure for 1956 traffic accidents.

A SAVING of 1,100 lives and the lowest mileage death rate in the nation's history!

This sums up the story of the traffic toll on the streets and highways of America for 1957.

The highway death total for the year was 38,500—down 3 per cent from the toll of 39,628 in 1956 which was virtually a dead heat with the all-time record of 39,969 established in 1941.

The 1957 mileage death rate (deaths per 100,000,000 vehicle miles of travel) was 5.9. The previous all-time low was 6.3 in 1956 and in 1954.

Every month of 1957 except August showed a drop or no change in traffic deaths from the same month in 1956.

The numerical drop of 1,100 in traffic deaths last year was the second largest to be achieved in any year since the end of World War II, and was surpassed only by a decrease of approximately 2,400 deaths in 1954.

December traffic deaths totalled 3,710—a 4 per cent drop from the toll of 3,858 in the same month of 1956—a saving of 150 lives in a month that traditionally brings peak danger on our streets and highways.

The improvement in the traffic record began in December, 1956, when the *"Back the Attack" on Traffic Accidents* campaign of the National Safety Council was launched.

The improvement continued through the first half of 1957 as the fatality toll dropped 2 per cent, and the decreases were even more marked in the remaining six months of the year which brought a drop in deaths of more than 3 per cent.

Glenn Bretthauer in the *Miami Herald*

While one year does not make an era of safer travel, 1957's record could well mark the turning point in the war on traffic accidents. It is significant that the improvement was attained in the face of a 4 per cent rise in motor vehicle travel.

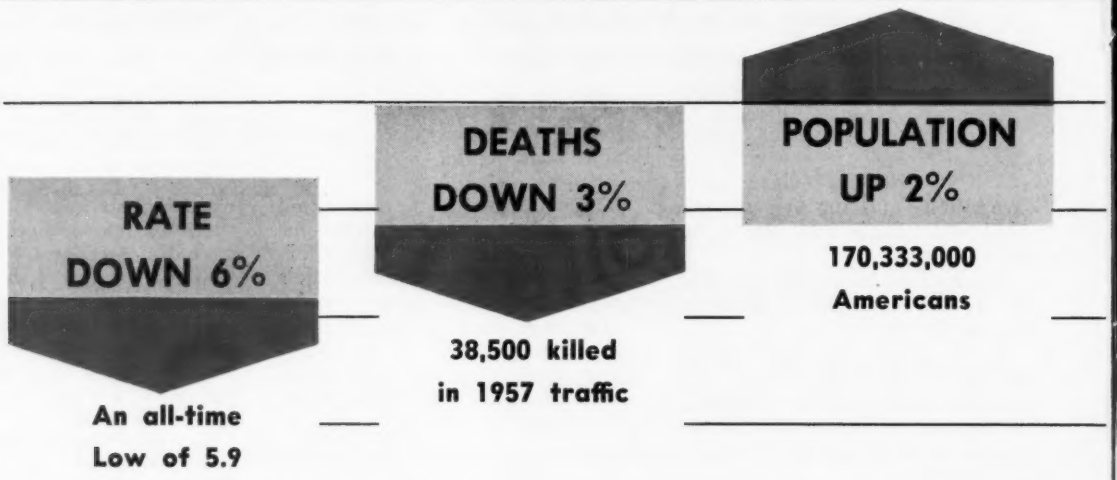
The National Safety Council noted several factors which had a favorable influence on the reduced death toll:

1. A strong program by the Governors' Conference which resulted in much favorable legislation and strict enforcement.
2. Increased and effective effort by mayors and enforcement agencies at all levels.
3. Stepped-up public education as a result of the near-record toll in 1956, which impressed the public with emergency aspects of the situation.
4. The improved safety design of automobiles, more widespread use of seat belts, and a more responsible tone in automobile advertising.
5. Better public support by industry and many citizen groups.

Approximately 1,350,000 persons were injured in motor vehicle accidents on America's roads and

HERE IS WHAT HAPPENED

Despite the hike in travel and the increase in vehicle registration, the death rate dropped to an all-time low of 5.9. The lives were saved primarily in rural areas.



Note: All figures are preliminary and subject to later revision. The NSC estimates have never

streets last year. The value of property destroyed and damaged in 1957 traffic accidents is estimated at $1,900,000,000. The economic loss chargeable to the traffic toll — all costs, including wage loss, medical expenses, overhead costs of insurance and motor vehicle property damage — approximates $5,300,000,000.

Where the Lives Were Saved

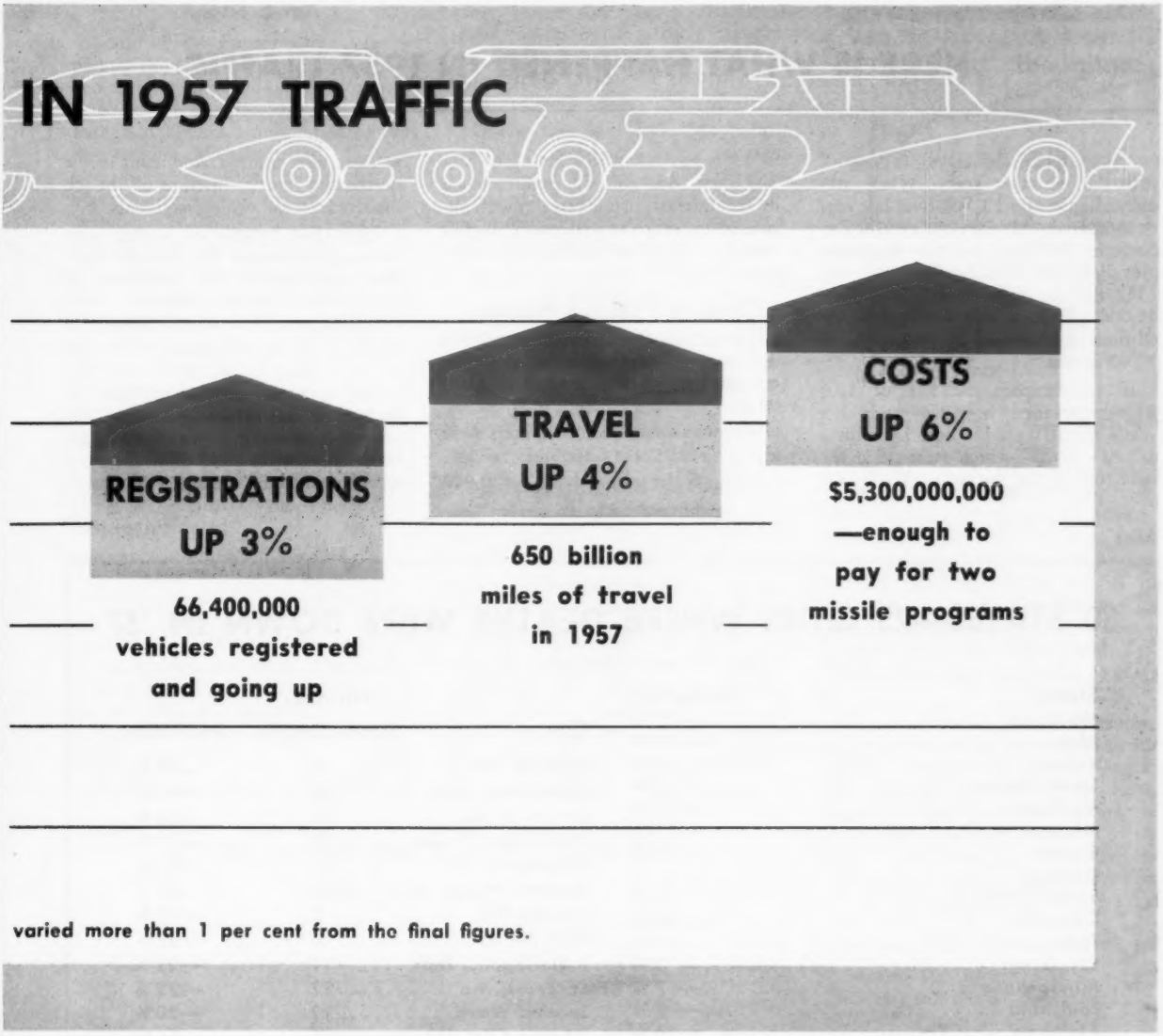
The decrease in deaths in 1957 occurred primarily in rural areas, where deaths were down 3 per cent from 1956. In urban areas deaths were down 2 per cent.

Deaths by Type of Accident: Sharpest drop in deaths in 1957 was accomplished in noncollision accidents (running off roadway, overturning, etc.) where the total was down 750 from 1956. Multi-vehicle collisions and pedestrian accidents each showed a decrease of 150 deaths, while in fixed object collisions deaths were down 100. Bicycle and street car accidents showed only small changes.

Decreases, however, did not occur in all accident types. Deaths in accidents with animals and animal-drawn vehicles remained unchanged and deaths in railroad accidents increased by 50.

Type of Motor Vehicle Accidents

Type	1957	1956	% Change
Non-collision	13,700	14,450	—5%
Multi-vehicle	13,500	13,650	—1%
Pedestrian	7,800	7,950	—2%
Fixed Object	1,500	1,600	—6%
Railroad	1,420	1,377	+3%
Bicycle	450	470	—4%
Animal	120	120	0
Street Car	10	11	—9%
Total	38,500	39,628	—3%



Deaths by Age Groups: Decreases in deaths occurred in all age groups.

Preliminary reports showed the largest decreases in the 15-24, 25-44, and 45-64 groups.

Age Group	1957	1956	% Change
0-4	1,700	1,770	—4%
5-14	2,600	2,640	—2%
15-24	8,700	9,169	—5%
25-44	11,400	11,551	—5%
45-64	8,300	8,573	—3%
65 and over	5,800	5,925	—2%
Total	38,500	39,628	—3%

Deaths by Regions: Deaths in 1957 were lower in all regions of the country.

The largest decreases were experienced in the North Central and Mountain Regions 5 per cent and 6 per cent respectively.

Region	1956-1957 Change
North Atlantic	—1%
South Atlantic	—3%
North Central	—5%
South Central	—3%
Mountain	—6%
Pacific	—2%

Last year, 625 cities reported their traffic accident experience to the National Safety Council. The reporting cities did not do so well as the nation as a whole. In contrast with the 3 per cent decrease for the entire country, they showed a 2 per cent drop in deaths for the entire year. For December alone, however, the reduction was 5 per cent from the record of the previous year.

To understand the full story of what happened last year in traffic, it is nec-

Turn Page

(continued) HERE IS WHAT HAPPENED IN 1957 TRAFFIC

essary to relate the travel experience with that of other years. While, numerically we saved 1,100 lives last year as compared with the number killed in traffic in 1956, had the same death rate prevailed last year as in 1956, our 1957 toll in traffic would have been 41,000. From a rate standpoint, the all-time low meant a reduction of 2,500 deaths.

If we compare the rate of 12.0 which prevailed in 1941 with last year's travel we will come up with a toll of 78,000—which means that the reduction in the death rate from 12.0 to 5.9 is equivalent to a saving of 39,500 lives. And this was accomplished in the face of rising travel (with increased exposure to accidents), higher vehicle registration figures and population.

Industry's Off-Job Problem

Industry's stake in traffic control and accident prevention is reflected in the off-job side of the worker accident totals.

Approximately 46,500 workers were killed in 1957—14,200 on the job, 32,300 off-the-job. About 4,450,000 workers were injured. And many of the deaths and injuries listed as off-the-job involved motor vehicle accidents.

Time lost because of worker accidents approximated 295,000,000 man-days, equivalent to the shut-down of plants with 1,000,000 workers.

Although motor vehicle deaths of workers off the job decreased by 500 in 1957, the total of 18,900 was still higher than the entire work total of 14,200, a fact which points up the need for industrial accident-prevention know-how in the field of traffic management on our streets and highways.

30 STATES—25 CITIES WHERE DEATHS WERE DOWN IN '57

States	Reduction
Montana	—21%
Idaho	—18%
Kansas	—15%
North Dakota	—13%
Michigan	—11%
Missouri	—11%
Florida	—11%
Georgia	—11%
South Dakota	—11%
Colorado	—10%
Tennessee	— 9%
Wyoming	— 9%
Massachusetts	— 7%
Louisiana	— 7%
Alabama	— 6%
Mississippi	— 6%
Pennsylvania	— 5%
Indiana	— 5%
Arizona	— 5%
California	— 4%
North Carolina	— 4%
Wisconsin	— 4%
Nebraska	— 4%
Maine	— 4%
New Hampshire	— 4%
Texas	— 3%
Illinois	— 2%
Iowa	— 1%
Connecticut	— 1%
New York	— *%

*Less than .5 per cent.

City	Number Fewer Deaths	Reduction
Norfolk, Va.	9	—47%
Milwaukee, Wis.	32	—43%
Louisville, Ky.	23	—38%
Fort Worth, Texas	19	—37%
Richmond, Va.	12	—35%
Boston, Mass.	20	—27%
Tampa, Fla.	9	—27%
Flint, Mich.	6	—27%
Indianapolis, Ind.	11	—23%
St. Louis, Mo.	22	—22%
Seattle, Wash.	12	—20%
Kansas City, Mo.	5	—14%
Omaha, Nebr.	4	—14%
Memphis, Tenn.	5	—13%
Chicago, Ill.	35	—10%
Detroit, Mich.	18	— 9%
Birmingham, Ala.	4	— 9%
Baltimore, Md.	9	— 8%
Syracuse, N. Y.	1	— 8%
Philadelphia, Pa.	12	— 7%
Providence, R. I.	1	— 6%
Denver, Colo.	2	— 5%
Los Angeles, Calif.	13	— 3%
Buffalo, N. Y.	2	— 3%
New Orleans, La.	1	— 1%

Only cities of more than 200,000 population.

Age of Cars

Some of the factors which play a part in the total travel picture are the age and condition of cars. According to the recently released "Automobile Facts and Figures," publication of the Automobile Manufacturers Association, more than 30 million of the nation's passenger cars are ten years old or under—20,000,000 of the passenger cars are more than 5 years old.

That the travel habits of the nation have changed is accented by the fact that intercity travel by automobile is 2½ times the pre-war rate. Of all intercity travel—88.21 per cent is by passenger car.

That America is on the move is obvious from a glance at the figures—a population of 170,333,000, with 650,000,000,000 miles of travel clocked in 1957, when there were 66,400,000 vehicles registered.

Economic Factors

The economics of the traffic problem are being brought home to all Americans, particularly those who live in the metropolitan areas. Losses due to traffic accidents and incidents have forced a hike in insurance rates—one method of bringing the problem home to all who drive.

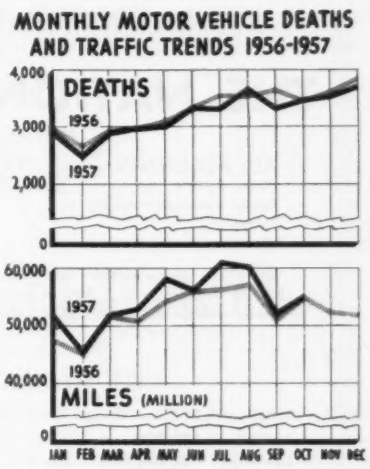
On the other hand, some communities where concerted programs of traffic control and accident prevention have borne fruit in reduced death and injury totals have had reductions in their insurance rates.

One such is St. Joseph, Mo., where the community traffic safety program is paying a dividend to citizens in thousands of dollars saved in automobile insurance premiums compared with other cities in the state.

In new rates published in 1957 by the National Bureau of Casualty Underwriters, St. Joseph had the lowest rates for any Missouri urban rating territory for liability insurance on passenger cars, and in some classifications lower than the "remainder of the state" territory, which covers the smaller towns and rural areas.

Collision premiums for passenger cars in the St. Joseph territory were lower than the "remainder of the state," and lower than in all other rating territories except the Springfield area which were the same.

Liability premiums on commercial vehicles were lower than four other territories, the same as for Joplin (Mo.) territory, and higher than for Springfield and "remainder of state" territories. There are eight rating territories in Missouri.



The differential between St. Joseph rates and those of other rating territories on private passenger automobiles is illustrated by the basic minimum coverage premium for public liability insurance: Class A: St. Joseph, $39; St. Louis, $66; Kansas City, $57; St. Louis suburban, $48; Kansas City suburban, $48; Springfield, $43; Joplin, $44, and remainder of state, $40.

This illustration of the economics of traffic accident experience is not meant to imply that only St. Joseph, Mo., has the answer to the traffic problem. But in terms of dollars and cents, the accident experience in the area in which one lives determines the claims costs, and—ultimately, the costs of insurance premiums paid.

City and State Tables and Charts

Reports for the entire year of 1957 for states and the 625 reporting cities, maps and other tables are listed on Pages 28, 29, 30 and 31 in this issue. The motor vehicle injury table is on page 58.

In December, 202 of the reporting cities had perfect no-death records. Of these, the three largest were: Omaha, Neb., (278,200); Tampa, Fla., (269,900), and Providence, R. I., (248,700).

For the entire year, only 92 cities had perfect records. Of these, the three largest were: Lynn, Mass., (99,000); Great Falls, Mont., (46,600), and Kokomo, Ind., (44,100).

The three leading cities for the year in each population size group, ranked

To Page 28

MOTOR VEHICLE DEATHS AND DEATH RATES

1955, 1956 and 1957

Month	1955	1956	1957	1955-57 Change	1956-57 Change
January	2,810	2,954	2,870	+ 2%	—3%
February	2,319	2,652	2,470	+ 7%	—7%
March	2,602	2,940	2,880	+11%	—2%
April	2,753	2,970	2,970	+ 8%	0%
May	3,101	3,094	3,000	— 3%	—3%
June	2,982	3,338	3,340	+12%	0%
July	3,350	3,555	3,240	— 3%	—9%
August	3,586	3,535	3,680	+ 3%	+4%
September	3,446	3,653	3,330	— 3%	—9%
October	3,918	3,476	3,480	—11%	0%
November	3,559	3,603	3,530	— 1%	—2%
December	4,000	3,858	3,710	— 7%	—4%
Total	38,426	39,628	38,500	0%	—3%

All 1955 and 1956 figures are from the National Office of Vital Statistics.

All other figures are National Safety Council estimates. The 1957 national estimate is arrived at by assuming that the percentage change from 1956 to 1957 in the states reporting for both years reflects the 1956-1957 change in the entire country. First reports are preliminary, so revisions are made from time to time as later reports are received for the various months. Thus, figures above for 1957 may differ slightly from figures for the same months which will be published in future issues of TRAFFIC SAFETY.

THE NATIONAL ACCIDENT FATALITY TOLL

	1957	1956	Change
ALL ACCIDENTS	95,000	94,780	0%
Motor-vehicle	38,500	39,628	— 3%
Public non-motor-vehicle	18,000	16,000	+13%
Home	27,500	28,000	— 2%
Work	14,200	14,300	— 1%

Note: The motor-vehicle totals include some deaths also included in work and home. This duplication amounted to about 3,200 in 1957 and 3,300 in 1956. All figures are National Safety Council estimates, except the 1956 all accident and motor-vehicle totals, which are from the National Office of Vital Statistics.

All Accidents

Killed—95,000, no change from 1956.

Injured—9,500,000.

Cost—$11,800,000,000. Includes wage loss, medical expense, overhead cost of insurance for all accidents; interrupted production schedules, time lost by workers other than the injured, etc., due to work accidents and property damage in traffic accidents and fires.

Deaths of children under 5 years numbered approximately 1 per cent lower than in 1956. Among children 5-14 years old the death total was up 3 per cent. Changes in adult groups were: 15-24 years, down 3 per cent; 25-44 years, no change; 45-64 years, no change; 65 years and older, up 2 per cent.

Fatal falls numbered about 2 per cent more than in 1956—20,700, burns went up 5 per cent to 6,700. Drownings also were up 7 per cent at 6,700. Fatal firearms accidents went up 2 per cent to 2,250.

The 1957 death rate per 100,000 population was 55.8.

Work Accidents

Killed—14,200, 100 less than the 1956 total.

Injured—1,950,000, 50,000 down from 1956.

Cost—$3,850,000,000. Includes cost of interrupted production schedules, time lost by workers other than the injured, etc., as well as wage loss, medical expense and the overhead costs of insurance.

Total all-industry employment was about 1 per cent more than in 1956. Manufacturing employment, however, went down nearly 1 per cent.

Coal mine deaths numbered 473 in 1957 according to preliminary reports, or 29 more than in 1956.

Railroad employee fatalities totalled 137 in the first nine months of 1957. The nine-month injury total was 8,281. Comparisons with 1956 figures cannot be made due to changes in I.C.C. reporting rules.

There apparently was a small decrease in the all-industry disabling injury rate. Employment increased slightly while average hours worked decreased, resulting in approximately the same exposure as in 1956.

Worker Accidents

Killed—46,500, the same as in 1956. On job, 14,200; off job, 32,300.

Injured—4,450,000, down 1 per cent from 1956.

Time lost, including indirect, amounted to 295,000,000 man-days, equivalent to the shut-down of plants with 1,000,000 workers.

Public Accidents

(Not Motor Vehicle)

Killed—18,000.

Injured—2,200,000.

Cost—$850,000,000.

Increases occurred in all age groups with the largest changes in the older age groups, 45 to 64 and 65 years and over.

There were sizeable increases in falls, drownings, and cataclysms and decreases in water and air transport.

Railroad Accidents

Nine-month death total—1,726. Injuries numbered 12,956. Comparison with 1956 figures cannot be made due to changes in I.C.C. reporting rules.

Grade crossing deaths increased 3 per cent to 938 while injuries decreased 1 per cent to 2,539 for the nine months.

Passenger deaths numbered 13, compared with 49 for the same months of 1956.

Trespasser deaths numbered 582, a decrease of 3 per cent from 1956.

Airplane Accidents

There were 4 fatal accidents during 1957 in the domestic passenger-carrying operations of scheduled air carriers, in which 30 passengers and 13 crew members were killed. The passenger death rate per 100,000,000 passenger-miles, based on preliminary information, was 0.11.

Home Accidents

Killed—27,500, down 2 per cent from 1956.

Injured—4,100,000.

Cost—$850,000,000.

Decreases occurred in three age groups, 0 to 4, 25 to 44, and 65 years old or older.

There was no change for the 5 to 14 year age group. Deaths in the other age groups increased.

Sizeable decreases were recorded for fatal falls and burns. There were increases in mechanical suffocation deaths and other specified causes.

Fire Losses

The value of property destroyed by fire in 1957 was $1,023,000,000, or 3 per cent more than in 1956.

CHICAGO'S HOLIDAY GIFT

Only One Death For Nation's Second Largest City

IN 1957 for the fifth successive year, fatalities in Chicago were reduced. There were 318 deaths last year, compared with 364 in 1956. The 12 per cent reduction in traffic deaths can be credited to the total impact on the public of a 10-year traffic safety program which began in 1948 when Chicago's police Traffic Division was reorganized in a program proposed to the city by the field division of the International Association of Chiefs of Police. During the 10-year period, there has been great improvement in enforcement, traffic court procedures, traffic safety education and legislation. In 1957 a new factor, "Plan H," was introduced. The following article describes "Plan H."

THE dialogue went something like this:

Police officer: "Beg your pardon sir, but haven't you had too much to drink?"

Citizen (about to get into car): "What do you mean?"

Officer: "I mean, sir, that if you get into that car and attempt to drive it, I will arrest you on a charge of driving while intoxicated. A drunk driving charge is a serious one. I'd prefer to call a cab for you."

The driver agreed to the alternative, the police officer hailed a cab and the citizen was driven home.

This scene with similar dialogue, allowing some variation for differences in persons and places involved, was a development of the Chicago police department Christmas "H (for Holiday) Plan." The plan slashed traffic accidents by 34 per cent on selected streets over the Christmas holiday in 1957 and helped establish the city's record reduction in traffic fatalities.

The 318 fatalities in Chicago in 1957 were the lowest number of fatalities since 1916 when few cars were on the streets.

Just before the year ended, another record was established. The 2-day Christmas season passed with only one traffic death. In 1956 during a 5-day holiday, 17 were killed. Over the 3-day 1955 Christmas holiday there were 16 deaths and in 1954, a 2-day holiday, 11 were killed. Comparing daily averages, traffic deaths in 1957 when

MAP OUT OPERATION FOR PLAN "H" FOR TRAFFIC SAFETY

Police officials pin-point "hot spots." From left: Captain John H. Scherping, Lt. Merle Nygren, Lt. Terrence Doherty, Traffic Chief Phillip A. McGuire, Deputy Chief Edward A. Satunas and Lt. John Madl.

"Plan H" was in operation were reduced 89 per cent from the daily average during Christmas seasons in 1956, 1955 and 1954.

Accident reductions were similar on other 1957 holidays with statistics telling a success story about "Plan H." And, while statistics do not tell a complete story, they do furnish a measure for the effectiveness of Chicago's program, said Police Commissioner Timothy J. O'Connor.

"This effectiveness does not rest only on enforcement," O'Connor said. "We know, however, that strong selective enforcement helped push accidents down on holidays and contributed much to the reduction of traffic deaths in 1957."

General George C. Stewart, executive vice president of the National Safety Council, called on Chicago's Mayor Richard J. Daley to congratulate him on the city's remarkable record during the holiday period.

"I want to congratulate you, Mr. Mayor, and the people of Chicago and others who supported the city's safety program," he said. "Chicago's record on traffic is outstanding."

General Stewart hailed the deathless Christmas holiday "a wonderful Christmas present to the people of Chicago and Cook County."

In substance, "Plan H" is a detailed selective enforcement program, said Police Captain Philip A. McGuire, Chief of the Traffic Division and author of the plan which was first tested on the 4th of July holiday, 1957.

The Traffic Division's Statistical Unit analyzed all accidents during July 3 and 4, 1956 and compiled lists of major violations charged, and times and places accidents occurred. This information was sent to all police commands dealing with traffic supervision. Commanders assigned additional manpower to sections of streets which the study indicated would probably be most productive of accidents.

"Plan H" went further than this. Accidents in the various categories from the 1956 holiday were spotted on large maps of Traffic Division areas. Comparison of these with maps kept on a day-to-day basis revealed any unusual pattern of accident occurrence and furnished more information for direction of assignments and extra vigilance, Chief McGuire said.

In addition: scheduled days off were canceled to keep all mobile equipment rolling; special radar units were assigned to streets where speed violations were predominant; red flasher lights, the "Mars" dome lights and 3-wheel lights, were kept on throughout the period. Supervisory personnel at command posts maintained a 24-hour watch with frequent telephone and radio contact to keep on top of developing situations which might cause congestion and increase accidents.

No plan is so good that it can be kept static. There must be flexibility to permit revisions. In this first test of "Plan H" the department was prepared to "change everything and anything," McGuire said, adding:

"We were gratified to find that no major change in the plan was necessary."

Statistics proved the worth of the plan.

On the 221 miles of streets selected for special enforcement, accidents over-all were slashed 50 per cent. In 1956 there had been 793 accidents (one every 10 minutes) during the 136-hour period. In the 1957 period of 112 hours, there were only 333 accidents (one every 20 minutes) on the same 221 miles of streets. There had been 3.2 accidents for each 100,000 estimated vehicle miles in 1956. This was reduced in 1956 to a rate of 1.7.

In adopting the successful July 4th "H Plan" to fit Labor Day conditions the nature of the traffic problem was assumed to be similar. Essentially the Labor Day plan remained the same.

And results were comparable.

Accidents on streets selected for special enforcement attention were reduced from 336 in 1956 to 95 in 1957, a reduction of 241. In the Central Traffic Area, accidents were cut from 50 to 14. There were 39 fewer accidents in the 11th traffic area; 82 less in the 15th; 28 fewer in the 25th and 56 less in the 39th.

There were no fatalities!

UP-TO-THE-MINUTE TRAFFIC REPORTS

Traffic Chief McGuire keeps radio and telephone contact with developing situations of traffic flow.

ACCIDENT INFO KEPT FOR REFERENCE

Punched cards giving details on 1957 accidents are taken from files and used in preparing the 1958 plan.

Chicago newspapers congratulated the department on the achievement. Stories under headlines proclaiming the "First Chicago Labor Day Without A Car Death," quoted Commissioner O'Connor's announcement:

"Chicago this year had its first deathless Labor Day week-end since police began keeping traffic records. Labor Day week-end deaths have averaged 5.

"The number of persons injured showed a sharp drop over the week-end. Only 192 were injured compared with 397 over Labor Day, 956.

"Accidents on all city streets declined slightly to 1,050 from 1,070 a year ago," the Commissioner said.

Reductions on streets where "Plan H" was in operation were about 38 times better. These streets showed 71.6 per cent fewer accidents.

With encouraging figures such as the statistical reductions on the 1957 holidays, Chicago was assured that in "Plan H" a sound, workable program for holiday traffic accident prevention had been found.

By establishing "Plan H" as normal procedure, the police department is not faced with the necessity of developing a new program every time another holiday approaches. Time can be spent on discussing special and supporting programs aimed at removing special hazards.

Accident prevention for the year's end holidays presents a special problem—drunk driving. Estimates were that "in three of every four serious accidents during the period intoxication of one or more of the persons involved is a factor contributing to the accidents."

Early in planning sessions, a special target day was elected—Christmas Eve. "December 24th or the last working day before Christmas, according to the records, is the year's 'most fatal day in traffic'," Chief McGuire said. "Drinking at office Christmas parties, in homes and restaurants, makes the drunken driving problem most severe."

In September, four months before the target day, Commissioner O'Connor urged through the press that all business firms ban liquor at office parties.

This request became part of the Christmas, 1957, "Pan H" program. Officers of the Traffic Division's Public Safety Education Unit personally contacted industries in police districts to which they were assigned.

More than 1,100 companies were canvassed. The response:

"Management in 90 per cent of these companies agreed not to serve liquor at Christmas parties," Commissioner O'Connor reported. "The program was heartily endorsed by radio and television commentators, and by newspapers, metropolitan and neighborhood."

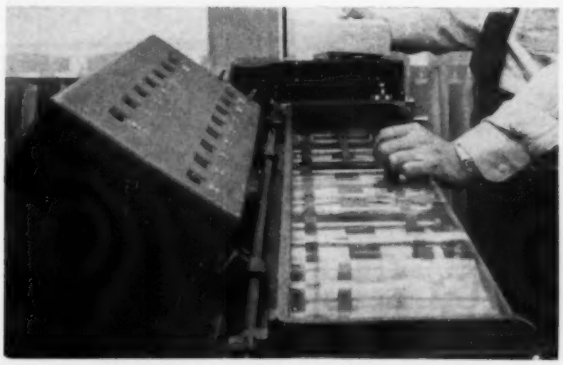
One of the fine points in the police Christmas "H Plan" included overtones of training in "how to win friends and influence people" techniques. On December 24th, officers were stationed in garages and parking lots in business districts and in restaurant and night club areas where drinking could be expected to be more concentrated. Their assignment:

"Question all persons who you suspect are intoxicated if it appears they intend to drive a car while under the influence. Be very polite. If questioning establishes any degree of intoxication, suggest other transportation. Offer to call a cab, to escort the person to convenient public transportation or urge him to let a sober member of his party drive. If he accepts your offer, see to it that his car is properly parked and locked and will be safe. If any intoxicated person insists on driving, arrest him immediately."

The foregoing explains the dialogue which began this article.

"I suppose you could call this 'the iron hand in the soft leather glove' treatment. Whatever it's called, it worked," Chief McGuire said. "This part of the program will be adopted in all future Christmas holiday traffic accident prevention programs."

"If proof is ever needed that enforcement, when backed up by educational programs and supporting action from other public agencies, can cut accidents, injuries and deaths in traffic, Chicago's 'H Plan' provides it," said Commissioner O'Connor.



CARDS CARRY PLANNING MATERIAL

Cards are run through a sorter which extracts required information. Data is sent to supervisors.

MAP AIDS PLANNING FOR HEAVY TRAFFIC

High accident areas are pin-pointed on large scale map to show areas for intensified enforcement.

HAMMOND CURBS PEDESTRIANS

by Lawrence Hoffman

THE BEST time to control the pedestrian in traffic is before he leaves the curb. Trying to correct him or to arrange sufficient time for his safe passage in traffic is a difficult assignment, once he has committed himself to the hazards of the intersection or crosswalk.

That's why Hammond's new pedestrian control signals are being changed over from "Walk," and "Don't Walk," to "Leave Curb," and "Don't Leave Curb." We feel that once the pedestrian is in the street very little can be done but to let him continue his movement.

The "Don't Leave Curb" indication plainly informs the pedestrian—"don't gutter-stand, stay out of the street—wait on the sidewalk." The "Leave Curb" signal tells the pedestrian—"now you may enter the street."

Prior to the switch in pedestrian signals, there had been much criticism from pedestrians because "Walk" indication wasn't long enough for them to cross the street.

We had an all walk interval with most of the intersections controlled with the "Don't Walk" signals. The "Walk" interval was timed to get the waiting pedestrians started into the streets. It ran from five to seven seconds. The "Don't Walk" with the all-red interval was timed to allow the last pedestrian leaving the curb to clear the traffic lanes.

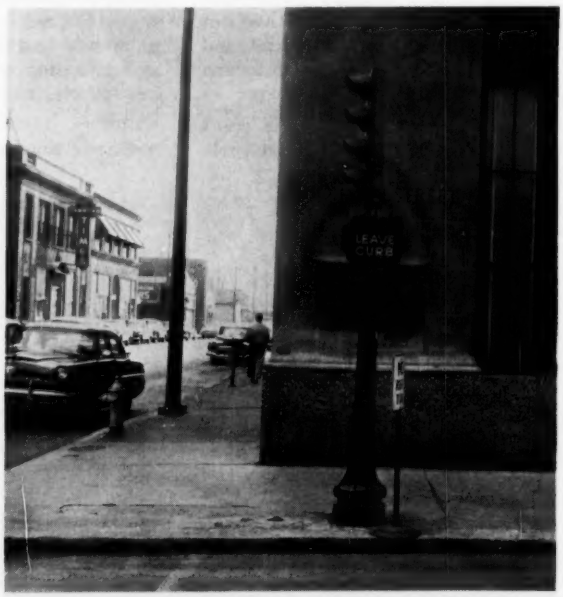
It seemed a waste of time to try and educate pedestrians that there was sufficient clearance time to permit them to cross streets safely. And our studies were conclusive that it was not feasible to control pedestrians with a three-interval light as we do motorists.

The author is Traffic Engineer for the City of Hammond, Indiana.

We studied the behavior of pedestrians at "Don't Walk" intersections. We found that after they left the curb on the "walk" indication and got a few steps into the street as the "Don't Walk" signal came on, they either retreated to the curb they had just left, or ran across the street.

The pedestrians who retreated to the curb again generally stood in the gutter and waited for the next "Walk" indication. This became a problem of police enforcement. And in this situation, it was very difficult for the police because the pedestrian believed the motorist was being favored.

Since installing the new signals, we found that in observing the "Don't Leave Curb" signal, pedestrians leaving the curb on the "Leave Curb" signal continued crossing the street at their normal gait. Obviously, the



THE POSITIVE APPROACH

When "Leave Curb" indication comes on, pedestrians step into street. Signal checks gutter-standing.

"Don't Leave Curb" signal says nothing about the pedestrian who has already left the curb. None returned to the curb they had left. The gutter standing of the "Don't Walk" intersection was eliminated.

Comments from pedestrians, motorists and the police has been favorable on the "Don't Leave Curb" signals.

We are switching our 48 "Don't Walk" intersections to "Don't Leave Curb" signals. Our control of pedestrians is accomplished via a pedestrian signal head 17¾ inches wide, 15 inches high, and 12¾ inches deep, using a 4,000 watt secondary transformer and one 5,000 volt secondary transformer. We use four circuits and tied the signal into the regular traffic signal controller.

The neon tube "Don't Walk" has 4½ inch letters, while the "Don't Leave Curb" signal tube uses 3½ inch letters, red in color to give a good signal indication for all locations. The maximum distance a pedestrian stands from these signals is 60 feet and the 3½ inch lettering is clearly legible at that distance.

There are six basic reasons why our new pedestrian control signal makes for better pedestrian control:

1. It controls the pedestrian before he enters the street.
2. It eliminates gutter standing.
3. It does not say anything or imply any change in direction for the pedestrian after he has left the curb.
4. It has eliminated criticism of pedestrians because with no additional time in the signal phase, their behavior during negotiating the crossing is such that they get maximum use of the time interval.
5. The new signals have changed the habits of the pedestrians while waiting on the curb. He stands on the sidewalk and thus eliminates contact with enforcement officers.
6. The new signal can be worked into any existing system by the changing of the neon tube or incandescent mask.

In any effort to control traffic and prevent accidents, a close look at the pedestrian control phase of the "attack on Accidents" is highly recommended. A substantial reduction in pedestrian deaths can make all the difference to a city which has put the fundamentals of traffic management to work in making its streets safe for all who walk and drive.

It must be remembered too that many pedestrian deaths come from older pedestrians who are struck by vehicles, or who slip and fall in trying to negotiate city streets. An accident is always serious to the older pedestrian and any extra effort is worth while to eliminate or minimize such hazards.

Finally, the new pedestrian signal promotes the expeditious flow of traffic —both walkers and drivers, and it also promotes obedience to traffic signals— a forward step in promoting obedience to law.

MOVING PEDESTRIANS KEEP COMING

"Don't Leave Curb" signal has no message for the pedestrian already in intersection. He keeps moving.

PEDESTRIAN STOPPER

"Don't Walk" indication inhibits movement of the pedestrian crossing street. He stops or is indecisive.

HOW TO DRIVE ON SNOW AND ICE

Seiberling Film Top School Training Aid

DRIVING on snow and ice—sometimes a hazardous experience—can be made safer and easier if motorists are trained to cope with highway conditions they are likely to face.

This was the premise that prompted the Seiberling Rubber Company to produce its film "How to Drive on Snow and Ice." It was made early last year in Burlington, Vt., using students and teachers of the Burlington High School driver education classes as its stars.

Filmed on nearby Lake Champlain, Seiberling's tire test men used material from the National Safety Council's Committee on Winter Driving Hazards winter driving tests.

With the film, Seiberling is offering a "Course of Study in Winter Driving"—a manual designed for use in the more than 10,000 high schools that sponsor driver education classes. The 38-page teacher's manual is sent free with the film which is available to schools on loan.

The 16mm motion picture runs 12 minutes and show winter driving techniques under all road conditions, demonstrates dos and don'ts of starting, stopping, and getting out of deep snow, and shows how to prepare a car for cold weather. It has no advertising.

The manual recognizes that high school-based driver education programs are already teaching correct principles of winter driving. But nowhere in courses of study and text books that have come to attention thus far has there been found a complete and unified treatment of the subject. The film and manual are an attempt to fulfill that need.

Primary purpose of the offering by

TAKE IT SLOW ON ICE OR SNOW

Driver training cars swing wide, drive slowly around high snowbank to show safe answer to problem. Snowbanks have "hidden hazards" particularly at curves and intersections, hiding cars coming at right angles.

Seiberling is to assist instructors in high school driver education classes in three directions:

1. Organizing and codifying winter driving know-how.

2. Emphasizing the importance of rules of safety in winter driving.

3. Calling attention to the role that can be played by interest-stimulating visual aids and instructional devices in the teaching of good winter driving practices.

The film and manual points up the fact that the driver must be prepared for winter. He must agree there is a problem and exhibit prudence and good judgment in driving defensively, slow down on ice and snow, and recognize the conditions peculiar to ice and snow and the motor car.

Preparation of the car is the next logical step and here the accent is on maintaining the best possible vision for winter with a double check on headlights, front bumper, front wheels, tires, radiator, cooling system, battery and generator, engine tune-up, oil, windshield and windows, defroster, exhaust system, brakes and miscellaneous items.

An understanding of the dynamics of stopping on snow and ice is highlighted by demonstrations of the braking distances required under varying winter conditions.

The film and manual can be had from the company's public relations department in Akron, Ohio.

MAINTENANCE CHECKPOINTS

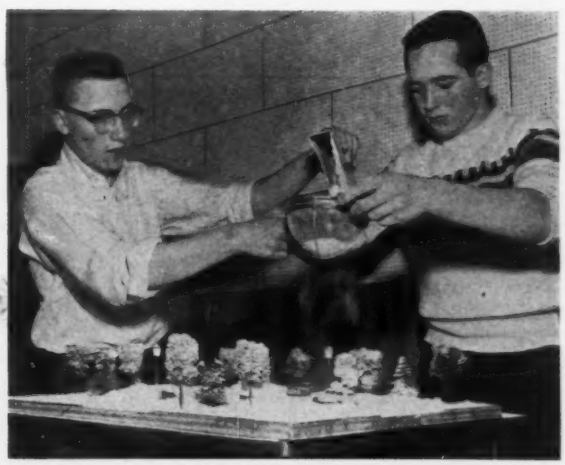
The cooling system—radiator, hoses, etc., battery and generator, carburetor and points are checked out.

GIVE YOUR BRAKES A BREAK

Instructor shows how ice can cause brake trouble unless the braking system is in perfect order.

YOU HAVE TO SEE AND BE SEEN

Instructor checks headlamps, points up importance of keeping them clean, checking the beam level.



HOME-MADE BLIZZARD

Students cause artificial snowstorm to pile up at model intersection until it hides one car from another.

FORT WAYNE LIGHTS A RISKY INTERCHANGE

by J. H. Hinman

Chief Electrical Engineer, City Utilities Bureau, Fort Wayne, Indiana

WHEN the standard cloverleaf interchange pattern is distorted by the presence of a railroad underpass at one end and a railroad overpass at the other, the unavoidable shifts in curve and grade that result can set an accident producing trap for the unsuspecting night motorist.

That was the situation at the intersection of US 30, US 24 and Indiana 14, at the eastern edge of Fort Wayne, Indiana, where the city and the State Highway Department of Indiana shared the $42,500 cost of a modern fluorescent lighting system. The lights were turned on last October 1 and, it is estimated, will be the means of preventing at least 15 fatal accidents.

The lighting system extends approximately 1300 feet each way from the interchange lanes of the cloverleaf and was designed for lumination levels somewhat higher than the Illuminating Engineering Society standards.

It covers about two miles of roadway, which includes the ramps. Actually, the system extends a distance of about a half mile on each of the two main highways, comprising 113 fluorescent roadway fixtures and eight fluorescent underpass fixtures. The overhead fixtures were spaced approximately 100 feet apart, but were varied in spacing to build up the lighting level at critical points and to taper off at the edges.

Designed for an excess of one footcandle maintained average with "tapering off" at the ends of the circuit and a "build-up" at the entrances of the ramps, the system used a General Electric PF-3 sensitive light meter to measure light levels when the circuit was initially turned on and tested. The meter indicated an average value of 2.4 footcandles on the main roadways and ramps with about 3 footcandles at the entrance to the ramps. The illumination on the main roadways tapered off to 0.6 footcandle at the ends of the circuit.

The East-West section of the highway had poles installed in the center strip, with two fixtures per pole. However, on the North-South section of the installation, because of cramped conditions, single fixture poles were installed at the edges of the roadway. The latter, it was found, provided a more uniform lighting job.

The underpass was lighted with standard fluorescent underpass fixtures to approximately a 3-footcandle level.

The overhead fixtures are General Electric Type 406S—4 lamp. Each fixture produces 21200 lumens of light which is equivalent to 17 ordinary 100 watt light bulbs.

The decision to use fluorescent light rather than mercury vapor or incandescent light was arrived at after careful evaluation of all three possible light sources. The factors which influenced the engineers' decision to use fluorescent fixtures were—(1) more lumens per watt, which means less energy costs, (2) longer lamp life, which means less lamp maintenance cost, (3) a better quality light which means more "seeability" and (4) the newest light fixture on the market, which will remain modern for years to come.

FLUORESCENT WITCHERY IN THE NIGHT

Night-lit interchange of US Routes 24 and 30 and Indiana 14 on the outskirts of Fort Wayne has taken the risk out of negotiating up and downgrades of clover leaf. Engineers say it will save at least 15 lives.

This cloverleaf is bounded on the south by the Wabash Railroad and on the north by the Nickel Plate Railroad. It was necessary to go under the Wabash and over the Nickel Plate and as a result, there was not sufficient space for a standard cloverleaf, and the curvature on the ramps was somewhat greater than normally, as was the change in elevation in parts of this system.

The ramp speed was limited to 20 miles an hour, and before the installation could be lighted, several night accidents indicated the necessity for a good lighting job. Fluorescent was used to eliminate glare and to provide a greater uniformity of lighting than could be obtained with "point" sources of illumination. Economic analysis indicated that over a period greater than ten years, the fluorescent was possibly the cheapest installation.

Since January 1956 there have been 11 known accidents on the cloverleaf, four of which were at night—before this lighting installation. The estimated cost of the nightime accidents is $4,000 to the public. Without lighting, this amount would increase as the traffic increases.

It is estimated that this lighting system will save at least 15 fatal accidents in its useful life. Traffic count on this cloverleaf indicates approximately 25,000 cars per day.

The lighting installation was done by the City of Fort Wayne Municipal Utilities, with the State Highway Department of Indiana paying for the section outside of the city limits in the form of a monthly rental charge, and the City of Fort Wayne furnishing the section inside the city as part of their normal street lighting activity. The design was approved by both city officials and state highway officials.

An example of the necessity for lighting in areas such as this is illustrated by an accident which occurred during the installation of the lighting system. The poles had been set, but the hardware and lighting fixtures had not been installed. The night after installation of poles, a driver missed one of the crossovers and broke a pole at ground level.

Center strip installation with two fixtures per pole had been considered the most economical plan, but the state highway safety engineers seriously objected to this design on general principles, and, where the center strip was only 4 feet wide, were very emphatic in their objection. However, they consented to such installation where the center strip was 15 feet wide, so the East-West section of the cloverleaf was so lighted.

Lighting engineers' investigation after the installation indicated, however, that more uniform lighting was accomplished by fixtures at the edge of the highway. With one fixture per pole at the edge, the consequent increase in cost was approximately $75 per fixture.

One of the difficulties of a lighting installation of this type is the beginning and the ending of the system. If there were some way the lighting level could be uniformly and gradually built up from zero to peak lighting level without prohibitive cost, by all means it should be installed.

Observation of this job indicates that when a car moving at 40 miles per hour moves out of the lighted area, there is some visual distress, and drivers have expressed opinion that the system should be continuous, because of the ease of night driving under this type of lighting. Present costs, however, prohibit the lighting of all highways.

At the dedication ceremonies on the evening of October 1, 1957, there was unanimous acceptance of this type of lighting system by visiting lighting engineers and safety people from this area. Since the installation, officials have received many favorable comments from people who use this cloverleaf repeatedly, and it is believed by all people associated with the job that it is the best possible type of installation, considering needs and costs.

EXIT WELL LIT

Exit leading downgrade on the right floodlights the traffic problem of decelerating for ramp banks.

UNDERPASS LIT LIKE A STAGE

Fluorescents light up underpass of Fort Wayne clover leaf, reduce hazards of interchanging traffic.

NINE OUT OF TEN DRIVERS RATE THEMSELVES ABOVE AVERAGE

Ask yourself if you are a good driver! Chances are you will answer "yes" whether you are or not.

It seems that the majority of drivers—even those with traffic violation records — consider themselves above average drivers, Walter G. Barlow, executive vice president of Opinion Research Corp., Princeton, N. J., told the Media Advisory Group of the President's Committee for Traffic Safety.

Reporting on a study sponsored by Pure Oil Co. and the ATA Foundation, the education, research and public information organization for supplier cooperation with the trucking industry, Mr. Barlow said the results of the pilot study show that the key to the driver's psychology seems to be his self-image of a good and law abiding driver.

The study was made to determine if mass communications can actually motivate people to become safer drivers and if so, what approaches, themes or actions promise to be most effective.

Of the groups interviewed in the study, Mr. Barlow said, about nine out of 10 adults considered themselves above average in driving skills. When asked "How well do you handle your car? That is, aside from obeying the laws, how good a driver are you?" 5 per cent answered, "Probably one of the best on the road." Twenty-four per cent considered themselves "definitely above the average of other drivers they know"; 64 per cent thought of themselves as "a little above average" and only 2 per cent felt they were "a little below average." There were no takers for the rank of "somewhat below average" or "a lot below average."

Everyone, actually 100 per cent, of the persons interviewed who had previous violations classed themselves as above average as well as 98 per cent of those with no violations. Mr. Barlow pointed out that while the percentages of the pilot study might change in a broader projection, he felt sure the self-images would remain the same.

The pilot research brought out, Mr. Barlow said, that the "good and law abiding driver" is a powerful symbol for traffic safety communications—a symbol with which every driver can readily identify himself.

In principle, he said, "communications that insult the driver's self-image as a good driver are less likely to be accepted by people than those that build on this image. Admonitions like 'drive safely' imply that the communicator does not look on the driver as a competent or responsible person. This seems to be one strike against these warnings right from the outset."

Regional Conference Calendar

- **FOUR conferences will be held in 1958 to muster support for the priorities established at the Public Officials Conference. The first — at Atlantic City, March 11 and 12, will rally the top leadership in the Eastern Region.**
- **LEADERS in the Midwest will rally at Chicago, April 1 and 2. The Western Regional Conference at San Francisco, April 8 and 9, will drum up support for Action Program priorities among the eleven Western states.**
- **THE SOUTHERN Regional Conference is slated for Miami Beach, Fla., for May 29-30.**
- **Attendance at each of the four conferences is expected to approximate 1,000. Delegates will be furnished reports and needs will be pinpointed state by state.**
- **BUSINESS of the regional conferences will be to muster public support of and backing for recommendations.**

Test Talk

0.05 blunts critical judgment

There is much evidence that the driving behavior of some people is adversely affected from drinking even though the blood alcohol level is less than 0.05 per cent. Pharmacologists have shown that as a first result of drinking, the fine edge of alertness and judgment is blunter. H. Ward Smith of the Toronto Crime Laboratory states: "A study of the accident situation reveals that low concentrations are similar to those which have been found to affect driving performance, namely 0.03 to 0.05 per cent."

U. S. Army uses influence form

The provost marshal, United States Army, Europe, has developed a standard form for use by military police in recording formal observations for drunkenness. The "observation" method involves simple observations of the individual without the application of any "tests" whatever, during the normal course of apprehension, investigation and processing. In any case of suspicion or accusation of drunkenness, the result of these observations, and the opinion formed thereby, are recorded even where complete sobriety is indicated.

The standard form used by the army is an adaptation of the "Alcoholic Influence Report Form" developed by the National Safety Council's Committee on Tests for Intoxication. The United States Army recognizes the importance of recording, in an uniform manner, the "objective symptoms" of intoxication as well as the results of chemical test evidence.

Tests measure unburned alcohol

Chemical tests for intoxication do not determine the total quantity of alcohol consumed. What they do show is the *unburned alcohol* in the blood and the body at the time of the test, which is precisely the information desired in testing a driver. The human body can burn alcohol quite rapidly, and this occurs mostly in the liver. The rate of burning depends on the person's size and the efficiency of his liver tissue to oxidize alcohol.

Social drinker still problem in traffic

In spite of past and present efforts to increase safety education and traffic enforcement, too many drinking drivers are still operating on our streets and highways. A drinking driver was involved in at least 30 per cent of all fatal traffic accidents during 1956 (1957 statistics are not available at this time) and 22 out of a hundred adult pedestrians killed in 1956 had been drinking. The social drinkers are a greater menace than commonly believed as their critical judgment is impaired with fairly low alcohol concentration and they outnumber the obviously intoxicated drivers.

Up use of tests in DWI cases

Cities of more than 10,000 population reporting in the Annual Inventory of Safety Activities that are using chemical tests, employed chemical tests to determine intoxication in 74 per cent of their driving while under the influence arrests. This use of tests in DWI cases varied all the way from 8 per cent in the 350,000 to 500,000 group to 94 per cent in the 100,000 to 200,000 group.

Good Morning, Judge

Kansas proposes stiff DWI penalty

Kansas State Safety Director Claud R. McCamment has proposed, with the endorsement of the Kansas Safety Council, the licenses of drivers convicted for the first time of drunken driving be suspended for one year and that the license be revoked for life following a second conviction. Present Kansas laws call for a six-month suspension on an initial conviction and one year on a second conviction. In addition it was recommended that a person found guilty of drunken driving and causing an accident be jailed for a maximum of one year with penalty going to life imprisonment if the accident results in death or serious injury.

Wisconsin Suspends Juveniles

Wisconsin courts must either suspend or revoke the license of a driver under 18 years of age upon the youth's first conviction of a moving traffic violation. The Badger State courts may revoke the operating privilege of a driver for any given period up to one year when he is convicted of violating any of the state traffic laws or any local ordinance that conforms to state law. The judge who orders the issuance of an occupational license may revoke the license when facts warrant such action.

Would abolish JP courts

According to the American Judicature Society, early in 1957 the Ohio Legislature abolished all justice of the peace courts and set up in their place a statewide system of county and municipal courts. Voters in Illinois will vote on a "proposed court reform" on November 4, 1958, providing for a circuit court to replace all present trial courts, including justices of the peace and police magistrates. The fee system would be abolished. Magistrates appointed by the circuit court would be paid by the state for full-time work.

Human life most precious resource

The upsurge in traffic fatalities is a challenge to our material and spiritual resources. It causes us to pause and wonder whether or not, as a civilized people, drunk with machine power, we have lost sight of the cardinal principle that, after all, human life is the most precious thing on this earth, and that the highest and most sacred duty we owe as citizens is the preservation of human life through an organized society.

—Hon. Alfred P. Murrah, U. S. Court of Appeals, Oklahoma City—

Violations involved in 8 of 10 fatals

According to traffic accident statistics prepared by the Michigan State Police, eight out of ten of the fatal traffic accidents in Michigan during 1956 involved driver violations of traffic laws. Among these, excessive speeds accounted for 47 per cent with "wrong side of road-not passing" next with 13 per cent. The actual number of violations which occur but remain undetected is anyone's guess. Too often it is not the long arm of the law, but the cold hand of death which descends on the traffic violator.

Fellowships:

YALE POINTS UP FUTURE FOR TRAFFIC ENGINEERS

The Bureau of Highway Traffic at Yale University predicts great strides in the field of highway transportation during the next ten years.

Recent developments in the scientific study of traffic operations include the use of high speed computers in the planning and design of streets and highways. New methods of traffic research are possible through the use of these computers which simulate traffic movements throughout road networks and at complex intersections. Through the application of simulation techniques, the conflicts and delays in traffic may be measured and analyzed in the laboratory where a variety of different solutions are tested before new highway construction or traffic regulations are employed.

Electronic controls capable of detecting instantaneous traffic demands at the focal point of traffic congestion are being perfected to step up traffic operation efficiency. Electronics may also be utilized to replace human judgment in the operation of motor vehicles so far as safety is concerned.

The expanded federal and state highway construction program, along with urban renewal, to be completed within the next decade will have a marked effect on the pattern of urban living. Highway and regional planning will develop new concepts of the relationships of transportation to urban sociological and economic factors. Additional research and the application of technical skills will be employed to obtain the greatest benefits from highway and renewal investments.

Since the complexities of modern traffic require scientific treatment, cities and states will increasingly seek the results of traffic research and the services of professional traffic engineers. The demand for traffic engineers already exceeds the rate of their graduation from colleges and universities.

The Yale Bureau of Highway Traffic pointed up a glowing future for traffic engineers as it announced that fellowships were available to qualified graduate engineers who are citizens of the United States and would like to enter the profession of traffic engineering as a career.

The fellowships cover a full academic year of graduate study, starting in September, 1958 and terminating the following May. They provide a living stipend of $1,400 disbursed at the rate of $175 per month for a period of eight months, while a student is enrolled. The fellowships also provide tuition of $600, which amounts to a total value of $2,000 for each fellowship.

The fellowships are made available to the Bureau through grants from the Automotive Safety Foundation, the Esso Safety Foundation, The Liberty Mutual Insurance Company, and The James S. Kemper Foundation.

In addition to the fellowships, the Bureau offers tuition scholarships to qualified municipal and state highway engineers who will receive salaries from their employers while undertaking the graduate work. This arrangement is considered by many employers a form of in-service personnel training.

The academic year of study offered by the Bureau consists of two full semesters of classroom work, laboratory and individual research, required reading, field problems and seminars. The courses include (1) traffic characteristics and measurements, (2) traffic regulations and control devices, (3) highway planning, (4) highway location and geometric design, and (5) highway administration and finance. Traffic experts from all over the country are invited to speak as guest lecturers at frequent intervals.

Applications for admission and fellowships may be obtained by writing to Fred W. Hurd, director, Bureau of Highway Traffic, Yale University, Strathcona Hall, New Haven, Conn.

Closing date for filing applications is March 1, 1958. Previous experience in traffic work is not essential to become a successful candidate for a fellowship or scholarship when high academic qualifications are indicated.

The Driver's Prayer

Lord, lead me today in safety through the lanes of this busy world. Help me to keep my mind and my eyes on the road, while my heart rests in Thee. Let me see in each of those who walk or ride the image of Thyself, dear Lord. As I thank Thee for the blessings of modern travel, grant that I bear the crosses of traffic in the spirit of true penance. Keep me in Thy gracious charity, so that all my journeying may end at last in Thee.

(From the "Hour of St. Francis" radio and television program, 218 E. 12th St., Los Angeles 15, California)

SLOUGH—BRITAIN'S SAFETY TOWN

Busy industrial town stages successful road safety experiment — cuts toll while national rate rises

by Ernest C. Thomson

MOTORISTS speeding westwards from London Airport along Britain's Great West Road smiled wryly two years ago when big roadside signs began to appear: *Slough—the Safety Town.* If there was a short way of tempting fate, this seemed to be it.

Windsor, sedate and leisured, with its Royal castle crowning the wooded hills two miles to the south, could perhaps venture on such a claim. But Slough — noisy, busy, industrial Slough?

Yet this densely-populated factory town (Slough rhymes with how), straddling a main traffic artery between London and the West of England has proved itself an ideal place for one of the biggest and most successful road safety experiments ever attempted in Britain.

For two years this bustling borough of 70,000 people — two miles wide and about six miles long, encrusted with factories, workers' homes, and schools—has been a testing ground for every conceivable method, new and old, to keep death off the highway.

And after two years, despite a steady increase in traffic—and in population, too — Slough has the last laugh. The road signs did not lie. Slough has proved itself the Safety Town in actual fact.

Merely to point out that fatal and serious injury accidents have dropped by 8 per cent is to give an incomplete picture. If the figures had kept pace with the rest of the country, the accident rate, far from falling, would have gone up by 11 per cent. Slough, then, can claim an advantage of 19 per cent. That, in 24 months, is enough to make the world take notice.

All Hands to the Plow

No one concerned with road safety was left out. Buckinghamshire County Police shared the work with Slough Borough Council, with the Road Safety Council, the Road Research Laboratory and other organizations. Propaganda was coordinated with training, engineering with effective police operations. And the verdict given by the Management Group is that "The Slough Experiment has been a most worthwhile venture."

The campaign opened with a blaze of propaganda. Households were peppered with free illustrated brochures outlining the experiment. Factories were circularized, shop-windows and buses bedecked with stickers. A "Safety Town" song was composed and played in movie-houses; 15,000 copies of the music were sent to schools. A grim beacon at the main crossroads shone red for a whole week after a fatal accident, green at other times.

Basic safety training was aimed mainly at children. Adults were encouraged to deepen their existing road sense. Voluntary refresher courses for motorists, road safety rallies, and a learner-driver scheme for motorcyclists served this purpose well.

Animal Farm

Police visited schools to help teachers with road safety demonstrations. A typical experiment in kindergartens and first grades was the Safety First Farmyard Party. This was a working model of a busy street, complete with toy cars, traffic signs, gasoline stations and the rest. But the pedestrians were animals.

The main casualty was "Silly old Duck who trusted to luck to get to the other side."

In contrast was "The wise old Hen. She knew where and when it was safe to cross the road."

Schools with an accident-free record at the end of each year received a Certificate of Merit from the mayor. An inter-school safety quiz was so successful that it is to be repeated annually.

Slough is a great bicycle town—hence the popularity of a Safe Cycling

Mr. Thomson is a London writer and commentator.

CROSS-COUNTRY traffic moves through Slough on way to London.

Proficiency Scheme for children of nine and older. Hundreds of children qualified after training for a cycling "license" and a proficiency pennant to attach to their bicycles. A school of cycling, organized by Raleigh Industries and Slough Safety Council, taught youngsters on an indoor street equipped with road signs and pedestrian crossings.

About 46,000 pedestrians cross Slough's High Street every day. To help them cross without delaying traffic, progressive timing by lights was installed so that vehicles proceeded in waves at a set speed, with pedestrians getting the signal to cross in between at pedestrian crossings. A master controller counts the number of vehicles and automatically varies the cycle time according to the density of traffic, slowing cars when traffic is heavy.

Only One Casualty at Crossing

In ten months there was only one pedestrian casualty at a crossing. It occurred when the lights were switched off for repair. Total casualties on High Street for the 10 months fell to 19; in previous years they averaged 25. Serious and fatal casualties had formerly equalled one quarter of total casualties. That figure fell to one tenth. The average speed of vehicles in the controlled section dropped by about 1½ miles per hour.

Before the experiment began, 26 per cent of Slough pedestrians invited accidents by crossing busy High Street away from stipulated pedestrian crossings. Two years of propaganda and police coaxing brought this figure down to 11 per cent.

Bicyclists, impervious to advice not to carry packages in their hands, were responsive in other ways. More were seen to give hand-signals before turning. Car drivers also showed a definite improvement in this respect. After two years, vehicles "jumping the lights" showed a 5 per cent decrease.

Slough not only is safer now, but feels safer. Public opinion surveys began even before the experiment. As time went on, more and more people reported their conviction that the town was safer than others. Before the experiment, only 9 per cent of Slough's pedestrians considered their town safer than others. After two years the figure has risen to 48 per cent, and six pedestrians out of ten affirm that because of the experiment they now feel safer from traffic dangers.

INDUSTRY sponsored bicycle safety training for youngsters.

VOLUNTARY refresher courses were given to Slough motorists.

POSTERS were used widely to promote "Safety Town" program.

Latest Traffic Accident Data

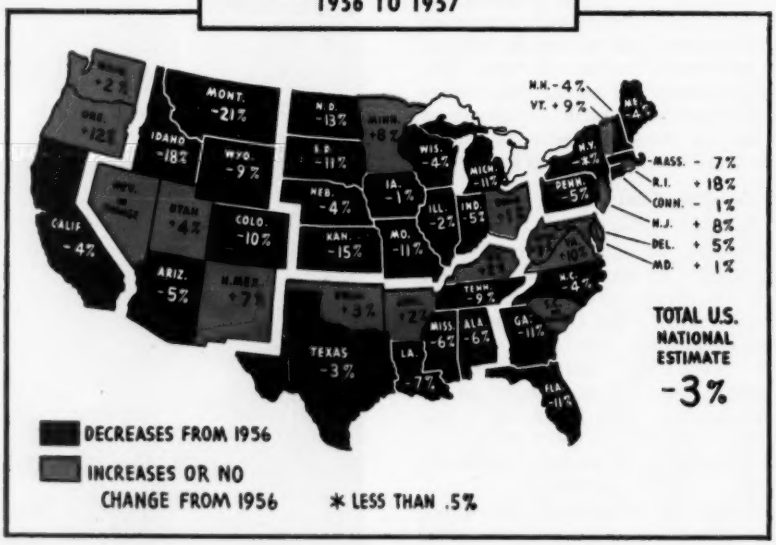
From Page 11

according to deaths per 10,000 registered vehicles were:

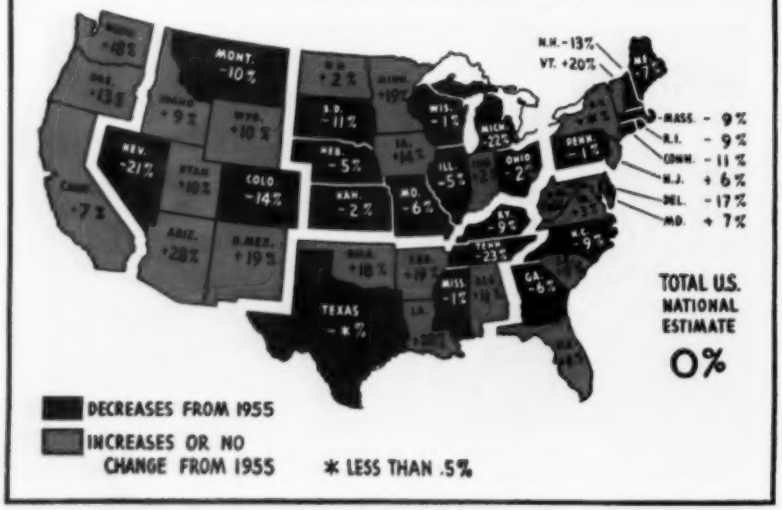
Group I (1,000,000 and over)		
Detroit, Mich.	2.7	9.4
Chicago, Ill.	3.1	8.6
Baltimore, Md.	3.4	10.3
Group II (750,000-1,000,000)		
St. Louis, Mo.	2.7	9.3
San Francisco, Calif.	3.0	11.0
Washington, D. C.	3.1	8.0
Group III (500,000-750,000)		
Milwaukee, Wis.	1.7	5.9
Seattle, Wash.	1.8	8.4
Minneapolis, Minn.	2.3	9.2
Group IV (250,000-500,000)		
Indianapolis, Ind.	1.6	8.0
Denver, Colo.	1.7	7.6
Kansas City, Mo.	2.0	6.8
Group V (200,000-350,000)		
Norfolk, Va.	1.1	3.3
Wichita, Kan.	1.3	8.0
Tulsa, Okla.	1.4	8.1
(Group VI (100,000-200,000)		
Montgomery, Ala.	0.4	1.7
Hartford, Conn.	0.7	2.1
Lubbock, Texas	0.8	3.8
Group VII (50,000-100,000)		
Lynn, Mass.	0.0	0.0
Pensacola, Fla.	0.2	2.0
Racine, Wis.	0.3	1.2
Group VIII (25,000-50,000)		
Poughkeepsie, N. Y.	0.0	0.0
Kokomo, Ind.	0.0	0.0
Great Falls, Mont.	0.0	0.0
Group IX (10,000-25,000)		
Kingsport, Tenn.	0.0	0.0
Benton Harbor, Mich.	0.0	0.0
Chico, Calif.	0.0	0.0

STATE and city death records listed on these pages are reported to the Council by state and city agencies participating in the Council's accident reporting project. Reporting deadline for cities—the 23rd, for states—the 25th, of the following month.

CHANGES IN MOTOR-VEHICLE DEATHS 1956 TO 1957



CHANGES IN MOTOR-VEHICLE DEATHS 1955 TO 1957



FIRST 1958 FACTS

GET your preliminary condensed edition of *Accident Facts* for 1958. Reprints are issued to meet public demand for prompt, though incomplete, information on the 1957 accident totals.

All 1957 figures are subject to revision as later information is received. The regular edition of *Accident Facts* will be issued in July and will contain a complete analysis of 1957 accidents.

Single copies of this reprint may be obtained from the National Safety Council without charge. Prices for quantity orders on request.

TRAFFIC DEATHS—STATE RECORDS

Deaths are reported by state traffic authorities.

All figures are preliminary. To insure proper comparisons, 1956 and 1955 figures cover the same reporting period as those for 1957.

Population Rate: U. S. population rate is the estimated annual number of deaths per 100,000 population, assuming that deaths for the rest of the year will follow the normal seasonal pattern. State population rate is the estimated annual number of deaths per 100,000 population, assuming that the monthly average of deaths will remain at the present average for the rest of the year. Population rates are based on July 1, 1957, population estimates, U. S. Bureau of the Census, Washington, D. C.

States shown in heavy type have improved in 1957 compared with 1956, or showed no change.

Mileage Rate: The number of deaths per 100 million vehicle miles of travel.

(Figures in parenthesis following the 1957 mileage rate indicate the number of months for which the mileage rate is calculated for each state.)

*Less than .5%.

	Months Reported	Deaths Identical Periods 1957	1956	1955	% Changes 1956 to 1957	1955 to 1957	1957 Pop. Rate	1957 Mile. Rate	
TOTAL U.S.	12	38,500	39,628	38,426	— 3%	0%	22.6	5.9	(12)
Ala.	12	910	963	823	— 6%	+ 11%	28.9	8.4	(10)
Ariz.	12	460	486	359	— 5%	+ 28%	40.5	8.6	(11)
Ark.	12	493	485	415	+ 2%	+ 19%	27.9	7.7	(11)
Calif.	12	3,653	3,805	3,422	— 4%	+ 7%	26.2	5.7	(10)
Colo.	12	367	408	429	— 10%	— 14%	21.9	4.3	(7)
Conn.	12	284	286	320	— 1%	— 11%	12.6	3.0	(10)
Del.	12	91	87	109	+ 5%	— 17%	20.8	4.7	(10)
D. of C.	12	69	54	72	+ 28%	— 4%	8.3	2.6	(10)
Fla.	12	1,060	1,194	978	— 11%	+ 8%	25.9	5.6	(10)
Ga.	12	988	1,115	1,051	— 11%	— 6%	26.1	6.7	(11)
Idaho	12	203	247	186	— 18%	+ 9%	31.7	6.8	(10)
Ill.	12	2,096	2,135	2,195	— 2%	— 5%	21.7	5.9	(10)
Ind.	12	1,161	1,217	1,142	— 5%	+ 2%	25.6	5.6	(10)
Iowa	12	689	696	606	— 1%	+ 14%	24.6	6.7	(10)
Kans.	12	579	681	592	— 15%	— 2%	27.1	5.8	(9)
Ky.	12	783	765	860	+ 2%	— 9%	25.8	7.7	(10)
La.	12	817	883	663	— 7%	+ 23%	26.6	7.5	(11)
Me.	12	153	160	164	— 4%	— 7%	16.2	3.5	(10)
Md.	12	550	547	513	+ 1%	+ 7%	19.0	5.5	(10)
Mass.	12	517	555	569	— 7%	— 9%	10.6	3.1	(10)
Mich.	12	1,511	1,706	1,928	— 11%	— 22%	19.4	4.9	(10)
Minn.	12	685	657	575	+ 8%	+ 19%	20.6	5.1	(10)
Miss.	12	522	556	527	— 6%	— 1%	23.9	6.7	(10)
Mo.	12	993	1,119	1,062	— 11%	— 6%	23.3	5.2	(10)
Mont.	12	210	267	234	— 21%	— 10%	31.5	5.9	(10)
Neb.	12	301	314	318	— 4%	— 5%	20.7	4.3	(9)
Nev.	12	139	139	175	0%	— 21%	52.1	6.5	(6)
N. H.	12	92	96	106	— 4%	— 13%	16.1	4.0	(10)
N. J.	12	833	772	789	+ 8%	+ 6%	14.8	3.5	(10)
N. M.	12	427	398	360	+ 7%	+ 19%	51.4	9.4	(10)
N. Y.	12	2,191	2,199	2,186	— *%	+ *%	13.8	4.6	(10)
N. C.	12	1,059	1,106	1,162	— 4%	— 9%	23.5	7.1	(10)
N. D.	12	147	169	144	— 13%	+ 2%	22.8	5.5	(10)
Ohio	12	2,036	2,009	2,071	+ 1%	— 2%	22.1	5.3	(10)
Okla.	12	701	680	593	+ 3%	+ 18%	30.8	6.7	(8)
Ore.	12	464	416	409	+ 12%	+ 13%	26.2	5.7	(10)
Pa.	12	1,682	1,762	1,695	— 5%	— 1%	15.2	4.3	(9)
R. I.	12	80	68	88	+ 18%	— 9%	9.7	2.7	(10)
S. C.	12	715	715	712	0%	+ *%	30.2	8.8	(10)
S. D.	12	175	196	197	— 11%	— 11%	24.9	5.3	(10)
Tenn.	12	695	760	902	— 9%	— 23%	20.1	5.3	(9)
Texas	12	2,501	2,584	2,511	— 3%	— *%	27.4	5.7	(9)
Utah	12	222	214	202	+ 4%	+ 10%	26.1	5.8	(10)
Vt.	12	106	97	88	+ 9%	+ 20%	28.2	6.9	(11)
Va.	12	907	824	877	+ 10%	+ 3%	23.9	5.9	(10)
Wash.	12	545	532	462	+ 2%	+ 18%	20.0	4.8	(10)
W. Va.	12	478	438	368	+ 9%	+ 30%	24.2	7.8	(5)
Wis.	12	917	953	927	— 4%	— 1%	23.7	6.3	(9)
Wyo.	12	157	172	143	— 9%	+ 10%	49.7	7.5	(9)
CANADIAN PROVINCES									
Alta.	11	232	242	205	— 4%	+ 13%	26.9	.....	.....
B. C.	10	190	245	179	— 22%	+ 6%	19.6	.....	.....
Man.	11	122	132	95	— 8%	+ 28%	17.1	.....	.....
Sask.	11	120	111	—	+ 8%	—	15.8	.....	.....

TRAFFIC DEATHS—CITY RECORDS

The table covers only motor-vehicle deaths resulting from traffic accidents that occurred in the city. Nontraffic motor-vehicle deaths (where the accident occurred on home or work premises) are not included; nor are deaths in the city from accidents occurring outside.

Rankings are based on the 1957 registration death rate which is the number of deaths per 10,000 registered motor vehicles on an annual basis. Vehicle registration figures are for the year 1957 and were supplied by R. L. Polk & Company.

Cities are ranked by death rates—from low to high. When two or more cities have exactly the same rate, ranking is by total vehicle registrations—from large to small.

Cities shown in heavy type have improved in 1957 compared with 1956.

The population death rate is the number of deaths per 100,000 population on an annual basis. Populations are as of April, 1950, or later censuses taken by the U. S. Bureau of the Census.

	Twelve Months 1957	1956	1955	1957 Reg. Rate	1957 Pop. Rate
ALL REPORTING CITIES				2.3	9.2
Group I (1,000,000 and over)					
1. Detroit, Mich.	179	197	227	2.7	9.4
2. Chicago, Ill.	318	353	389	3.1	8.6
3. Baltimore, Md.	106	115	99	3.4	10.3
4. Philadelphia, Pa.	171	183	180	3.4	8.2
5. Los Angeles, Calif.	400	413	365	3.5	17.8
All cities in this group				3.5	9.5
6. New York, N. Y.	616	609	647	4.3	7.9
Group II (750,000 to 1,000,000)					
1. St. Louis, Mo.	80	102	94	2.7	9.3
2. San Francisco, Calif.	85	83	93	3.0	11.0
3. Washington, D. C.	69	55	72	3.1	8.0
All cities in this group				3.1	10.1
4. Cleveland, Ohio	115	105	97	3.7	11.9
Group III (500,000 to 750,000)					
1. Milwaukee, Wis.	42	74	46	1.7	5.9
2. Seattle, Wash.	48	60	38	1.8	8.4
3. Minneapolis, Minn.	48	47	40	2.3	9.2
4. Dallas, Texas	68	52	42	2.5	11.7
All cities in this group				2.6	9.7
5. Houston, Texas	102	70	83	2.8	14.3
6. Pittsburgh, Pa.	56	55	62	2.8	8.3
7. Buffalo, N. Y.	56	58	53	2.9	9.3
8. Boston, Mass.	53	73	70	3.0	7.3
9. Cincinnati, Ohio	62	55	79	3.4	11.4
10. New Orleans, La.	71	72	63	4.0	11.8
Group IV (350,000 to 500,000)					
1. Indianapolis, Ind.	37	48	45	1.6	8.0
2. Denver, Colo.	36	38	46	1.7	7.6
3. Kansas City, Mo.	31	36	39	2.0	6.8
4. Portland, Ore.	47	43	39	2.3	11.4
5. Louisville, Ky.	37	60	54	2.3	9.4
6. Memphis, Tenn.	34	39	39	2.4	6.9
7. Columbus, Ohio	47	44	43	2.6	10.9
All cities in this group				2.6	10.3
8. San Antonio, Texas	59	57	57	2.9	13.0
9. Birmingham, Ala.	40	44	46	3.3	11.3
10. San Diego, Calif.	66	62	57	3.8	13.4
11. Atlanta, Ga.	72	58	59	4.0	14.6
Group V (200,000 to 350,000)					
1. Norfolk, Va.	10	19	11	1.1	3.3
2. Wichita, Kan.	18	17	13	1.3	8.0
3. Tulsa, Okla.	18	10	11	1.4	8.1
4. Syracuse, N. Y.	12	13	12	1.4	5.6
5. Flint, Mich.	16	22	34	1.5	7.8
6. Miami, Fla.	37	37	30	1.6	14.3
7. Rochester, N. Y.	24	16	26	1.7	6.9
8. Providence, R. I.	16	17	17	1.8	6.4

	Twelve Months 1957	1956	1955	1957 Reg. Rate	1957 Pop. Rate
9. Oklahoma City, Okla.	26	18	17	1.8	9.1
10. Dayton, Ohio	28	28	32	2.0	10.8
11. St. Paul, Minn.	28	24	35	2.0	8.9
12. Richmond, Va.	22	34	23	2.0	9.3
13. Fort Worth, Texas	33	52	32	2.0	10.0
14. Tampa, Fla.	24	33	26	2.0	8.9
15. Omaha, Neb.	24	28	22	2.1	8.6
All cities in this group				2.1	9.9
16. Toledo, Ohio	33	30	26	2.2	10.9
17. Honolulu, T. H.	33	18	23	2.4	13.3
18. Jacksonville, Fla.	20	19	27	2.4	8.0
19. Long Beach, Calif.	59	40	44	4.4	17.6
20. Akron, Ohio	60	39	32	4.8	19.6

Group VI (100,000 to 200,000)

1. Montgomery, Ala.	2	6	11	0.4	1.7
2. Hartford, Conn.	4	9	9	0.7	2.1
3. Lubbock, Texas	4	5	14	0.8	3.8
4. Lincoln, Neb.	4	9	2	0.8	3.3
5. Yonkers, N. Y.	5	8	8	1.0	2.8
6. Madison, Wis.	5	7	4	1.0	4.5
7. Niagara Falls, N. Y.	4	19	10	1.1	4.0
8. Sacramento, Calif.	11	21	17	1.1	7.0
9. Knoxville, Tenn.	7	12	12	1.2	5.6
10. Wilmington, Del.	8	4	6	1.3	7.2
11. Nashville, Tenn.	13	27	19	1.3	7.5
12. Arlington, Va.	8	11	5	1.4	5.1
13. Fort Wayne, Ind.	11	12	9	1.4	7.6
14. Phoenix, Ariz.	23	40	21	1.4	14.4
15. Fresno, Calif.	14	9	10	1.4	12.5
16. Kansas City, Kan.	10	10	12	1.5	7.7
17. Waterbury, Conn.	5	7	14	1.5	4.4
18. Trenton, N. J.	8	9	7	1.5	6.3
19. Allentown, Pa.	7	9	14	1.5	6.3
20. Salt Lake City, Utah	15	25	13	1.5	7.8
21. South Bend, Ind.	10	12	5	1.6	8.2
22. Grand Rapids, Mich.	18	22	17	1.6	9.3
23. Peoria, Ill.	9	5	12	1.6	7.9
24. Baton Rouge, La.	11	11	6	1.6	7.7
25. Austin, Texas	11	16	20	1.6	6.7
26. Amarillo, Texas	8	11	10	1.6	8.0
27. Rockford, Ill.	11	7	11	1.6	9.8
28. Shreveport, La.	12	20	11	1.7	7.7
29. Jackson, Miss.	9	12	16	1.7	7.6
30. Berkeley, Calif.	8	12	6	1.7	6.8
31. Des Moines, Iowa	16	8	14	1.8	8.7
All cities in this group				1.9	9.2
32. Tacoma, Wash.	15	12	16	2.0	9.5
33. Canton, Ohio	13	14	7	2.0	10.2
34. Evansville, Ind.	13	11	9	2.1	7.7
35. New Haven, Conn.	11	11	11	2.1	6.6
36. Corpus Christi, Texas	15	18	18	2.2	10.3
37. Waco, Texas	10	11	9	2.2	9.9
38. Saginaw, Mich.	12	11	11	2.3	11.8
39. Charlotte, N. C.	20	23	18	2.4	12.8
40. Gary, Ind.	17	32	20	2.4	10.1
41. Glendale, Calif.	13	15	8	2.4	11.2
42. San Jose, Calif.	22	27	17	2.4	17.2
43. Youngstown, Ohio	20	23	27	2.5	11.3
44. Albuquerque, N. M.	19	8	14	2.5	11.2
45. Bridgeport, Conn.	15	11	9	2.6	8.6
46. Spokane, Wash.	22	24	14	2.6	11.7
47. Utica, N. Y.	9	2	4	2.6	8.5
48. Reading, Pa.	12	2	11	2.7	10.5
49. St. Petersburg, Fla.	26	14	20	3.0	19.6
50. Chattanooga, Tenn.	18	26	14	3.1	13.7
51. Savannah, Ga.	16	12	15	3.2	12.2
52. Pasadena, Calif.	21	14	17	3.3	18.3
53. Erie, Pa.	21	10	9	3.3	15.3
54. Duluth, Minn.	16	12	12	3.7	15.2
55. Mobile, Ala.	24	25	17	3.8	13.8
56. Hammond, Ind.	20	17	11	5.4	18.9

Group VII (50,000 to 100,000)

1. Lynn, Mass.	0	3	2	0.0	0.0
2. Pensacola, Fla.	1	4	4	0.2	2.0
3. Racine, Wis.	1	4	7	0.3	1.2
4. Kenosha, Wis.	1	5	6	0.4	1.5
5. Ann Arbor, Mich.	1	3	2	0.4	1.8
6. New Rochelle, N. Y.	1	5	4	0.4	1.4
7. Alameda, Calif.	1	2	2	0.5	1.4
8. Fort Lauderdale, Fla.	4	9	7	0.6	6.4
9. Santa Barbara, Calif.	2	2	8	0.6	3.9
10. Springfield, Ill.	3	3	14	0.6	3.6
11. Reno, Nev.	2	2	4	0.6	3.8
12. St. Joseph, Mo.	2	4	2	0.7	2.5
13. Mt. Vernon, N. Y.	2	2	5	0.7	2.7
14. Pawtucket, R. I.	2	5	4	0.7	2.3
15. Pontiac, Mich.	4	6	16	0.7	5.0
16. New Britain, Conn.	2	1	7	0.8	2.3
17. Orlando, Fla.	5	5	8	0.8	5.6
18. Raleigh, N. C.	4	4	6	0.8	5.6
19. W. Palm Beach, Fla.	3	10	6	0.8	5.9
20. Terre Haute, Ind.	3	11	9	0.8	4.6
21. Schenectady, N. Y.	4	2	3	0.9	4.3
22. Muncie, Ind.	3	9	5	0.9	4.6
23. Berwyn, Ill.	2	1	2	0.9	3.8
24. Charleston, W. Va.	4	6	7	0.9	5.4
25. Colorado Spgs., Colo.	4	6	4	0.9	6.4
26. Abilene, Texas	3	3	6	0.9	4.9
27. Anderson, Ind.	3	4	6	0.9	6.0
28. Augusta, Ga.	3	7	5	0.9	4.0
29. Council Bluffs, Iowa	2	4	3	0.9	3.8
30. Medford, Mass.	2	7	1	1.0	3.1
31. Dubuque, Iowa	2	2	4	1.0	3.9
32. Pittsfield, Mass.	2	2	9	1.0	3.6
33. Burbank, Calif.	5	3	7	1.0	5.5
34. Manchester, N. H.	3	8	5	1.1	3.4
35. Bay City, Mich.	3	4	3	1.1	5.7
36. Wilkes-Barre, Pa.	3	2	4	1.1	3.9
37. Columbus, Ga.	4	2	7	1.1	4.5
38. Lancaster, Pa.	4	5	2	1.1	5.9
39. Wichita Falls, Texas	4	5	3	1.1	4.4
40. Lakewood, Ohio	3	5	2	1.2	4.3
41. Kalamazoo, Mich.	6	9	3	1.2	10.0
42. W. Hartford, Conn.	2	4	3	1.2	3.8
43. Lexington, Ky.	5	4	4	1.2	7.4
44. Lake Charles, La.	4	5	2	1.2	7.1
45. Oak Park, Ill.	3	11	4	1.3	4.9
46. Evanston, Ill.	4	4	2	1.3	5.3
47. Jackson, Mich.	5	6	6	1.3	9.6
48. Hamilton, Ohio	5	7	5	1.4	7.1
49. Portsmouth, Va.	4	5	2	1.4	4.4
50. San Mateo, Calif.	4	8	7	1.4	6.6
51. Elmira, N. Y.	3	3	1	1.4	5.9
52. Richmond, Calif.	4	10	8	1.5	4.0
53. Springfield, Ohio	6	3	6	1.5	7.0
54. Alexandria, Va.	7	6	1	1.5	8.2
55. Charleston, S. C.	3	4	3	1.5	4.3
56. West Allis, Wis.	3	3	1	1.5	4.8
57. Joliet, Ill.	6	11	6	1.6	9.7
58. Warren, Ohio	5	9	7	1.6	8.8
59. Tuscaloosa, Ala.	3	5	4	1.6	5.3
60. Lansing, Mich.	9	6	9	1.6	9.2
61. Cedar Rapids, Iowa	6	6	4	1.6	7.6
62. Waterloo, Iowa	5	5	4	1.6	7.2
All cities in this group				1.6	7.7
63. Tucson, Ariz.	14	17	5	1.7	20.0
64. Decatur, Ill.	7	8	4	1.7	9.5
65. Hayward, Calif.	6	6	6	1.7	10.9
66. Binghamton, N. Y.	6	3	6	1.7	7.4
67. Stamford, Conn.	5	5	8	1.7	5.7
68. Brookline, Mass.	3	5	6	1.7	5.3
69. Johnstown, Pa.	6	2	10	1.7	9.4
70. Topeka, Kan.	9	6	4	1.7	10.9
71. Royal Oak, Mich.	7	5	6	1.7	9.9
72. Greenville, S. C.	7	7	6	1.7	9.2
73. Durham, N. C.	6	5	5	1.8	8.4
74. Davenport, Iowa	6	8	6	1.8	7.4
75. Waltham, Mass.	3	5	4	1.8	6.0
76. Battle Creek, Mich.	7	1	5	1.9	13.6
77. Green Bay, Wis.	6	7	4	1.9	10.9
78. Albany, Ga.	4	6	5	2.0	7.7
79. Euclid, Ohio	4	5	2	2.0	7.0
80. Aurora, Ill.	6	0	3	2.1	10.6
81. Pomona, Calif.	6	3	9	2.1	10.2
82. Bloomfield, N. J.	4	4	2	2.1	7.9
83. Sioux Falls, S. D.	6	3	5	2.2	10.1
84. Lwr. Merion Twp. Pa.	4	4	4	2.2	6.9
85. Passaic, N. J.	4	3	4	2.3	6.9
86. Santa Ana, Calif.	10	6	9	2.3	14.4
87. Winston-Salem, N. C.	12	7	7	2.3	13.2
88. Springfield, Mo.	9	3	6	2.3	11.3
89. Greensboro, N. C.	11	4	4	2.3	13.5
90. Woonsocket, R. I.	4	2	7	2.4	8.0
91. Roanoke, Va.	10	6	10	2.4	10.6
92. Macon, Ga.	10	4	6	2.4	14.2
93. Sioux City, Iowa	8	12	2	2.5	9.0
94. Asheville, N. C.	7	4	8	2.5	13.2
95. Columbia, S. C.	12	7	5	2.6	12.5
96. Gadsden, Ala.	4	4	9	2.6	6.2
97. Bethlehem, Pa.	8	11	4	2.7	10.3
98. Brockton, Mass.	6	3	7	2.7	9.6
99. Beaumont, Texas	13	7	9	2.7	13.8
100. Covington, Ky.	7	7	3	2.9	10.8
101. Meriden, Conn.	5	6	6	2.9	8.6
102. East Orange, N. J.	8	9	3	3.0	9.3
103. San Bernardino, Calif.	16	16	12	3.1	19.3
104. Compton, Calif.	11	8	13	3.1	17.3
105. Lorain, Ohio	9	5	5	3.3	14.4
106. Wheeling, W. Va.	8	4	9	3.4	13.6
107. Stockton, Calif.	22	12	11	3.6	28.9
108. East Chicago, Ind.	7	8	1	4.1	12.2
109. Santa Monica, Calif.	13	10	11	4.3	17.0
110. Hoboken, N. J.	5	3	0	4.5	9.6
111. Atlantic City, N. J.	8	13	11	6.4	13.0
112. Norwalk, Conn.	11	8	7	7.8	17.5

Group VIII (25,000 to 50,000)

1. Poughkeepsie, N. Y.	0	1	4	0.0	0.0
2. Kokomo, Ind.	0	1	3	0.0	0.0
3. Great Falls, Mont.	0	2	3	0.0	0.0
4. Richmond, Ind.	0	1	2	0.0	0.0
5. Bloomington, Ind.	0	0	0	0.0	0.0
6. Wausau, Wis.	0	1	2	0.0	0.0
7. Galesburg, Ill.	0	1	2	0.0	0.0
8. Jackson, Tenn.	0	0	6	0.0	0.0
9. Daly City, Calif.	0	2	0	0.0	0.0
10. Mason City, Iowa	0	1	0	0.0	0.0
11. New Kensington, Pa.	0	1	1	0.0	0.0
12. National City, Calif.	0	2	4	0.0	0.0
13. New London, Conn.	0	7	1	0.0	0.0
14. Burlington, Vt.	0	2	1	0.0	0.0
15. Sumter, S. C.	0	0	2	0.0	0.0
16. Richland, Wash.	0	1	0	0.0	0.0
17. Concord, N. H.	0	1	4	0.0	0.0
18. Denton, Texas	0	3	0	0.0	0.0
19. Annapolis, Md.	0	1	3	0.0	0.0
20. Las Vegas, Nev.	1	2	10	0.3	2.2
21. Boise, Idaho	1	5	3	0.3	2.9
22. Billings, Mont.	1	2	3	0.3	2.6
23. St. Clair Shores, Mich.	1	6	5	0.4	2.1
24. Tallahassee, Fla.	1	0	3	0.4	2.6
25. Lafayette, Ind.	1	0	2	0.4	2.5
26. Casper, Wyo.	1	2	1	0.5	2.8
27. Hutchinson, Kans.	1	2	1	0.5	2.7
28. Plainfield, N. J.	1	1	2	0.5	2.1
29. Appleton, Wis.	1	3	6	0.5	2.0
30. Rock Island, Ill.	1	8	2	0.5	2.0
31. Cuyahoga Falls, Ohio	1	4	2	0.5	2.3
32. Bellingham, Wash.	1	4	5	0.5	2.7
33. Enid, Okla.	1	1	3	0.5	2.7
34. Fargo, N. D.	1	0	2	0.6	2.4
35. Oxnard, Calif.	1	12	5	0.6	3.5
36. Eau Clair, Wis.	1	1	11	0.6	2.8
37. Arlington, Mass.	1	2	2	0.6	2.1
38. Gainesville, Fla.	1	1	0	0.6	3.2
39. Yakima, Wash.	2	2	2	0.6	4.6
40. Hamden, Conn.	1	3	4	0.7	2.8
41. Findlay, Ohio	1	3	2	0.7	3.6
42. Westfield, N. J.	1	3	1	0.7	3.9
43. West Orange, N. J.	1	4	2	0.7	2.9
44. Fond du Lac, Wis.	1	1	4	0.7	3.0
45. Walla Walla, Wash.	1	1	1	0.7	3.9
46. Fair Lawn, N. J.	1	1	3	0.7	3.6
47. White Plains, N. Y.	2	6	3	0.7	4.0
48. St. Cloud, Minn.	1	3	3	0.7	3.1
49. Hazel Park, Mich.	1	3	4	0.8	3.8
50. Greenville, Miss.	1	2	0	0.8	2.9
51. Freeport, Ill.	1	2	0	0.8	3.9
52. Richfield, Minn.	1	0	0	0.8	2.8
53. Shaker Heights, Ohio	1	1	1	0.8	2.9
54. Oak Ridge, Tenn.	1	2	2	0.9	3.5
55. Elyria, Ohio	2	1	1	0.9	3.7
56. Grand Fo ks, N. D.	1	2	1	0.9	3.5
57. Urbana, Ill.	1	1	3	1.0	3.6
58. Owensboro, Ky.	2	7	4	1.0	5.1
59. Mt. Clemens, Mich.	2	0	2	1.0	7.3
60. Zanesville, Ohio	2	4	1	1.0	4.9
61. Birmingham, Mich.	3	0	1	1.0	11.6
62. Pasadena, Texas	2	0	6	1.0	4.2
63. La Crosse, Wis.	2	4	0	1.0	4.2
64. Culver City, Calif.	2	3	6	1.0	6.4
65. Palo Alto, Calif.	3	5	1	1.0	7.3
66. Mt. Lebanon, Pa.	1	0	0	1.1	2.9
67. Odessa, Texas	4	2	2	1.1	9.0
68. High Point, N. C.	3	3	3	1.1	6.8
69. Rochester, Minn.	2	0	3	1.1	6.4
70. Belmont, Mass.	1	2	2	1.2	3.5
71. Park Forest, Ill.	1	1	0	1.2	3.6
72. Cheyenne, Wyo.	3	0	0	1.3	7.2
73. Kingston, N. Y.	2	0	0	1.4	6.6
74. West Haven, Conn.	2	8	7	1.4	5.2
75. Easton, Pa.	3	4	4	1.4	7.5
76. East Detroit, Mich.	3	3	2	1.4	8.1
77. Fitchburg, Mass.	2	2	2	1.4	4.7
78. Vallejo, Calif.	3	5	4	1.4	6.8
79. Manitowoc, Wis.	2	0	2	1.5	6.7
80. St. Louis Pk., Minn.	2	1	3	1.5	5.2
81. Petersburg, Va.	2	5	4	1.5	5.5
82. Torrington, Conn.	2	0	5	1.5	6.1
83. Hagerstown, Md.	3	1	5	1.5	7.8
84. Salina, Kan.	3	2	2	1.6	9.3
85. Ventura, Calif.	3	3	3	1.6	11.6
86. Rome, Ga.	3	3	3	1.6	9.3
87. University City, Mo.	3	1	1	1.6	6.3
88. Teaneck, N. J.	2	1	7	1.6	5.2
89. Rahway, N. J.	2	2	6	1.6	7.4
90. Sheboygan, Wis.	3	3	2	1.6	6.3
91. Coral Gables, Fla.	3	6	2	1.6	10.3
All cities in this group				1.6	7.9
92. Minot, N. D.	2	2	2	1.7	8.0
93. Champaign, Ill.	3	5	2	1.7	6.7
94. Everett, Wash.	4	2	7	1.7	11.5
95. Waukegan, Ill.	4	5	1	1.7	8.6
96. Hamtramck, Mich.	3	6	2	1.7	6.5
97. Elgin, Ill.	4	5	3	1.8	8.4
98. Portsmouth, Ohio	3	11	8	1.8	8.2
99. Tyler, Texas	5	5	6	1.8	11.0
100. Ferndale, Mich.	3	2	1	1.8	9.6
101. Beverly Hills, Calif.	4	4	4	1.9	13.2
102. Midland, Texas	5	4	0	1.9	13.7
103. Granite City, Ill.	3	5	3	1.9	8.7
104. Michigan City, Ind.	3	2	3	1.9	9.5
105. Steubenville, Ohio	3	1	7	1.9	8.3
106. Winona, Minn.	2	8	6	1.9	8.0
107. Elkhart, Ind.	5	0	2	1.9	12.9
108. Wauwatosa, Wis.	4	2	4	2.1	8.6
109. Monrovia, Calif.	3	5	4	2.1	11.9
110. Norwich, Conn.	3	4	2	2.1	7.0
111. Newburgh, N. Y.	4	3	4	2.2	11.8
112. Rapid City, S. D.	4	3	3	2.2	10.0

	Twelve Months 1957	1956	1955	1957 Reg. Rate	1957 Pop. Rate
113. Lockport, N. Y.	3	3	3	2.2	11.1
114. San Leandro, Calif.	6	2	7	2.2	17.6
115. Rock Hill, S. C.	3	1	8	2.2	9.0
116. Kearny, N. J.	**3**	**6**	**9**	**2.2**	**7.5**
117. East Cleveland, Ohio	4	1	3	2.3	10.0
118. Pocatello, Idaho	4	1	0	2.3	14.8
119. Beloit, Wis.	4	1	1	2.3	12.6
120. Chicopee, Mass.	**4**	**6**	**9**	**2.3**	**8.1**
121. Bangor, Me.	3	2	2	2.3	7.5
122. Wilmington, N. C.	**5**	**6**	**4**	**2.4**	**10.9**
123. Florence, S. C.	**3**	**4**	**3**	**2.4**	**10.5**
124. Elmhurst, Ill.	4	0	0	2.4	11.5
125. Montclair, N. J.	3	2	2	2.4	6.7
126. Quincy, Ill.	**5**	**8**	**5**	**2.5**	**11.8**
127. Kettering, Ohio	6	3	1	2.5	15.7
128. Wyandotte, Mich.	7	3	5	2.6	15.0
129. Lynchburg, Va.	5	3	3	2.6	10.5
130. Linden, N. J.	4	3	6	2.7	10.9
131. Newport News, Va.	4	1	1	2.7	8.2
132. Oshkosh, Wis.	5	1	3	2.7	11.4
133. Burlington, Iowa	4	2	1	2.8	13.1
134. Middletown, Conn.	**3**	**5**	**3**	**2.9**	**8.3**
135. Fairmont, W. Va.	4	0	0	2.9	13.7
136. Newark, Ohio	6	2	2	2.9	15.5
137. Daytona Beach, Fla.	5	4	1	3.0	13.8
138. Vancouver, Wash.	8	3	1	3.0	19.0
139. Clearwater, Fla.	7	5	2	3.0	24.1
140. Mishawaka, Ind.	5	2	2	3.1	14.7
141. Highland Pk., Mich.	6	5	10	3.1	12.9
142. Moline, Ill.	6	6	3	3.1	14.8
143. Provo, Utah	**4**	**5**	**2**	**3.1**	**12.2**
144. Fairfield, Conn.	4	3	9	3.1	13.1
145. Danbury, Conn.	5	4	4	3.2	13.2
146. Bloomington, Ill.	5	2	1	3.2	13.9
147. Milford, Conn.	4	1	2	3.2	10.4
148. Marion, Ohio	6	0	2	3.3	16.9
149. Middleton, Ohio	7	3	6	3.4	20.3
150. Bristol, Conn.	**4**	**6**	**4**	**3.6**	**9.0**
151. Roseville, Mich.	6	1	0	3.7	17.1
152. Sandusky, Ohio	6	2	5	3.7	18.2
153. West Covina, Calif.	5	3	5	3.8	12.2
154. Danville, Va.	7	6	2	3.9	14.5
155. Vineland, N. J.	**6**	**14**	**8**	**3.9**	**18.2**
156. East Hartford, Conn.	7	3	4	4.2	18.1
157. Stratford, Conn.	7	4	2	4.4	16.7
158. Lincoln Park, Mich.	8	5	2	4.6	18.0
159. Livonia, Mich.	9	8	17	4.9	23.1
160. Superior, Wis.	6	5	3	5.2	17.0
161. Greenwich, Conn.	9	6	11	5.7	18.9
162. Revere, Mass.	6	4	5	5.8	15.2
163. Temple, Texas	7	7	2	6.1	23.3
164. Manchester, Conn.	10	9	3	6.6	22.7

Group IX (10,000 to 25,000)

1. Kingsport, Tenn.	0	0	0	0.0	0.0
2. Benton Harbor, Mich.	**0**	**1**	**3**	**0.0**	**0.0**
3. Chico, Calif.	**0**	**1**	**2**	**0.0**	**0.0**
4. Fort Myers, Fla.	**0**	**3**	**0**	**0.0**	**0.0**
5. Waukesha, Wis.	**0**	**4**	**2**	**0.0**	**0.0**
6. Austin, Minn.	**0**	**3**	**0**	**0.0**	**0.0**
7. Lodi, Calif.	**0**	**2**	**2**	**0.0**	**0.0**
8. Kinston, N. C.	**0**	**1**	**1**	**0.0**	**0.0**
9. Lufkin, Texas	**0**	**2**	**1**	**0.0**	**0.0**
10. Bloomington, Minn.	**0**	**2**	**2**	**0.0**	**0.0**
11. Whitefish Bay, Wis.	0	0	1	0.0	0.0
12. La Grange, Ill.	**0**	**2**	**0**	**0.0**	**0.0**
13. Floral Park, N. Y.	0	0	1	0.0	0.0
14. Great Bend, Kan.	**0**	**2**	**2**	**0.0**	**0.0**
15. Plainview, Texas	0	0	1	0.0	0.0
16. Bismarck, N. D.	0	0	0	0.0	0.0
17. Meadville, Pa.	**0**	**1**	**1**	**0.0**	**0.0**
18. Port Chester, N. Y.	**0**	**3**	**1**	**0.0**	**0.0**
19. Goshen, Ind.	**0**	**1**	**1**	**0.0**	**0.0**
20. Huntington, Ind.	**0**	**2**	**0**	**0.0**	**0.0**
21. Sedalia, Mo.	0	0	0	0.0	0.0
22. Hibbing, Minn.	**0**	**1**	**0**	**0.0**	**0.0**
23. Peru, Ind.	**0**	**2**	**0**	**0.0**	**0.0**
24. Hanford, Calif.	0	0	1	0.0	0.0
25. North Platte, Neb.	0	0	0	0.0	0.0
26. Corvallis, Ore.	**0**	**3**	**0**	**0.0**	**0.0**
27. Griffin, Ga.	0	0	2	0.0	0.0
28. Frankfort, Ind.	0	0	0	0.0	0.0
29. Wisconsin Rpds., Wis.	0	0	1	0.0	0.0
30. Mt. Vernon, Ill.	**0**	**1**	**2**	**0.0**	**0.0**
31. Emporia, Kan.	0	0	0	0.0	0.0
32. Connersville, Ind.	**0**	**4**	**1**	**0.0**	**0.0**
33. Bellevue, Pa.	0	0	0	0.0	0.0
34. Sterling, Ill.	**0**	**1**	**0**	**0.0**	**0.0**
35. East Lansing, Mich.	0	0	1	0.0	0.0
36. Highland Park, Texas	0	0	0	0.0	0.0
37. Moorhead, Minn.	0	0	3	0.0	0.0
38. Newton, Kan.	**0**	**1**	**0**	**0.0**	**0.0**
39. Mt. Pleasant, Mich.	**0**	**1**	**0**	**0.0**	**0.0**
40. Owatonna, Minn.	0	0	1	0.0	0.0
41. Faribault, Minn.	**0**	**1**	**0**	**0.0**	**0.0**
42. Norfolk, Neb.	0	0	0	0.0	0.0
43. Attleboro, Mass.	0	0	3	0.0	0.0
44. Bristol, Va.	**0**	**0**	**1**	**0.0**	**0.0**
45. Fergus Falls, Minn.	0	0	0	0.0	0.0
46. So. Orange, N. J.	0	0	0	0.0	0.0
47. Winfield, Kan.	0	0	0	0.0	0.0
48. Mamaroneck, N. Y.	**0**	**2**	**1**	**0.0**	**0.0**
49. St. Joseph, Mich.	0	0	0	0.0	0.0
50. Villa Park, Ill.	**0**	**1**	**6**	**0.0**	**0.0**
51. Atchison, Kan.	**0**	**1**	**2**	**0.0**	**0.0**
52. Albany, Calif.	0	0	0	0.0	0.0
53. Garden City, Kan.	**0**	**2**	**0**	**0.0**	**0.0**
54. Marshfield, Wis.	0	0	1	0.0	0.0
55. Gardner, Mass.	**0**	**2**	**0**	**0.0**	**0.0**
56. State College, Pa.	0	0	0	0.0	0.0
57. Mitchell, S. D.	0	0	1	0.0	0.0
58. Du Bois, Pa.	**0**	**1**	**0**	**0.0**	**0.0**
59. Logan, Utah	0	0	1	0.0	0.0
60. River Rouge, Mich.	**0**	**3**	**2**	**0.0**	**0.0**
61. Central Falls, R. I.	**0**	**1**	**0**	**0.0**	**0.0**
62. University Hts., Ohio	**0**	**1**	**0**	**0.0**	**0.0**
63. Red Wing, Minn.	0	0	1	0.0	0.0
64. Hornell, N. Y.	0	0	0	0.0	0.0
65. Cadillac, Mich.	0	0	1	0.0	0.0
66. Two Rivers, Wis.	0	0	0	0.0	0.0
67. West Lafayette, Ind.	**0**	**1**	**1**	**0.0**	**0.0**
68. Moscow, Idaho	0	0	0	0.0	0.0
69. Fairfield, Ala.	0	0	3	0.0	0.0
70. Webster, Mass.	**0**	**1**	**3**	**0.0**	**0.0**
71. Amherst, Mass.	0	0	0	0.0	0.0
72. Donora, Pa.	**0**	**1**	**0**	**0.0**	**0.0**
73. Aurora, Colo.	1	0	0	0.5	4.8
74. Santa Cruz, Calif.	1	1	1	0.6	4.4
75. So. Euclid, Ohio	1	1	1	0.6	4.4
76. Janesville, Wis.	1	1	0	0.7	3.1
77. Greensburg, Pa.	**1**	**2**	**2**	**0.7**	**5.7**
78. Houma, La.	1	0	0	0.7	7.5
79. Bell, Calif.	**1**	**2**	**0**	**0.8**	**5.4**
80. Uniontown, Pa.	1	1	1	0.8	4.7
81. El Cerrito, Calif.	**1**	**3**	**0**	**0.8**	**4.2**
82. Worcester, Ohio	1	1	3	0.9	6.2
83. Ames, Iowa	1	1	1	0.9	4.3
84. Tiffin, Ohio	1	0	1	0.9	4.9
85. Frederick, Md.	1	1	1	0.9	5.5
86. Jeffersonville, Ind.	1	0	3	1.0	5.2
87. Dennison, Texas	**1**	**4**	**3**	**1.0**	**4.8**
88. East Haven, Conn.	1	0	0	1.0	5.6
89. Caldwell, Idaho	1	0	1	1.0	8.5
90. Pittsburg, Kan.	1	1	0	1.0	4.8
91. Marietta, Ohio	1	0	1	1.0	6.1
92. Wheaton, Ill.	1	1	0	1.0	5.4
93. Highland Park, Ill.	1	1	8	1.0	4.8
94. Wilmette, Ill.	**1**	**3**	**1**	**1.0**	**5.0**
95. Streator, Ill.	1	0	1	1.1	5.7
96. Xenia, Ohio	**1**	**4**	**0**	**1.1**	**6.1**
97. Robbinsdale, Minn.	2	1	0	1.1	12.3
98. So. St. Paul, Minn.	1	0	2	1.1	5.8
99. Cranford, N. J.	1	0	0	1.1	4.4
100. Cape Girardeau, Mo.	1	1	1	1.1	4.5
101. Johnson City, N. Y.	1	1	0	1.1	5.2
102. Port Angeles, Wash.	1	1	1	1.1	8.4
103. Stillwater, Okla.	1	1	0	1.1	5.0
104. Pittsburg, Calif.	1	1	1	1.2	6.0
105. Ypsilanti, Mich.	2	1	3	1.2	8.0
106. Monroe, N. C.	1	1	2	1.2	9.5
107. Greenwood, Miss.	1	0	3	1.2	5.2
108. Boulder, Colo.	2	2	0	1.2	8.3
109. Arkansas City, Kan.	1	1	0	1.2	7.1
110. Suffolk, Va.	1	1	1	1.2	8.1
111. Cedar Falls, Iowa	1	1	3	1.2	5.6
112. Brainerd, Minn.	1	0	1	1.2	7.9
113. Niles, Ohio	**1**	**2**	**1**	**1.3**	**5.8**
114. No. Miami, Fla.	1	2	4	1.3	4.3
115. Elmwood Park, Ill.	1	1	6	1.3	4.5
116. Stevens Point, Wis.	**1**	**2**	**0**	**1.3**	**5.7**
117. Antioch, Calif.	1	1	0	1.3	6.5
118. Brookfield, Ill.	1	0	0	1.3	5.1
119. Modesto, Calif.	**5**	**12**	**7**	**1.3**	**20.3**
120. Rocky River, Ohio	1	0	1	1.4	6.7
121. Homewood, Ala.	2	0	1	1.4	11.1
122. North Adams, Mass.	**1**	**2**	**4**	**1.4**	**4.7**
123. Hollywood, Fla.	3	1	3	1.4	13.2
124. Boone, Iowa	**1**	**3**	**2**	**1.4**	**8.2**
125. Lamesa, Texas	1	1	0	1.4	9.3
126. Longview, Wash.	2	0	1	1.5	8.6
127. Lawrence, Kan.	2	1	0	1.5	8.6
128. Hopewell, Va.	**1**	**2**	**1**	**1.5**	**4.6**
129. Shelton, Conn.	1	1	1	1.6	6.1
130. Beaver Dam, Wis.	1	1	0	1.6	8.3
131. Mankato, Minn.	2	2	1	1.6	9.2
132. Virginia, Minn.	1	1	0	1.6	6.5
133. Bowling Green, Ohio	1	0	1	1.6	7.1
134. Vernon, Conn.	**1**	**2**	**0**	**1.6**	**9.9**
135. Morristown, N. J.	2	0	2	1.7	11.3
136. Mansfield, Conn.	1	1	3	1.7	10.0
137. Albion, Mich.	**1**	**3**	**0**	**1.7**	**7.1**
138. Bellefontaine, Ohio	1	0	2	1.7	9.3
139. Fremont, Ohio	**2**	**4**	**0**	**1.7**	**10.5**
140. Kenmore, N. Y.	2	0	1	1.7	8.4
All cities in this group				1.7	9.0
141. Butler, Pa.	3	1	2	1.8	12.3
142. Marinette, Wis.	1	1	1	1.8	7.0
143. Webster Groves, Mo.	2	0	1	1.8	7.9
144. Charles City, Iowa	1	0	1	1.8	9.7
145. Traverse City, Mich.	2	2	0	1.8	10.3
146. Borger, Texas	2	1	2	1.8	11.0
147. Holland, Mich.	3	0	0	1.8	17.6
148. Los Alamos, N. M.	1	0	0	1.9	7.5
149. Bemidji, Minn.	1	0	2	1.9	10.0
150. Westport, Conn.	**2**	**4**	**4**	**1.9**	**12.0**
151. Swampscott, Mass.	1	0	1	1.9	7.6
152. Ironwood, Mich.	1	1	2	1.9	8.7
153. Edina, Minn.	2	1	0	1.9	9.1
154. Ottawa, Ill.	2	1	1	2.0	11.1
155. Ashland, Ohio	2	1	2	2.0	13.9
156. La Mesa, Calif.	3	3	2	2.0	12.8
157. Muscatine, Iowa	**2**	**3**	**1**	**2.0**	**10.5**
158. Coffeyville, Kan.	2	0	0	2.0	11.4
159. Milford, Mass.	1	0	0	2.0	6.4
160. Bellaire, Ohio	1	1	3	2.0	7.9
161. Winchester, Conn.	1	0	0	2.0	9.5
162. La Salle, Ill.	1	0	3	2.0	7.4
163. Maple Heights, Ohio	**2**	**3**	**2**	**2.0**	**8.3**
164. Branford, Conn.	**1**	**5**	**5**	**2.0**	**6.5**
165. Garland, Texas	3	1	0	2.1	13.5
166. Reidsville, N. C.	2	0	1	2.1	17.1
167. Aberdeen, S. D.	2	2	1	2.1	9.0
168. W. Springfield, Mass.	**2**	**5**	**2**	**2.1**	**8.7**
169. Texarkana, Ark.	2	0	5	2.1	10.2
170. Ponca City, Okla.	3	2	3	2.2	13.0
171. Leominster, Mass.	2	2	2	2.2	8.1
172. Niles, Mich.	3	1	0	2.2	18.6
173. Victoria, Texas	4	1	2	2.2	17.9
174. Klamath Falls, Ore.	4	3	0	2.3	21.1
175. Statesville, N. C.	3	2	0	2.3	17.0
176. Alpena, Mich.	2	2	1	2.3	14.8
177. La Porte, Ind.	3	0	3	2.4	14.2
178. Derby, Conn.	1	0	0	2.4	8.5
179. Newport Beach, Calif.	**2**	**4**	**5**	**2.4**	**9.4**
180. Wallingford, Conn.	**2**	**4**	**2**	**2.4**	**8.1**
181. El Dorado, Kan.	2	0	0	2.4	16.9
182. Massena, N. Y.	2	1	0	2.4	12.5
183. Takoma Park, Md.	1	1	0	2.5	6.5
184. Sherman, Texas	3	0	5	2.5	13.5
185. Greeley, Colo.	4	2	1	2.5	16.5
186. McAlester, Okla.	2	0	0	2.5	11.2
187. Muskegon Hts., Mich.	**2**	**3**	**1**	**2.6**	**9.7**
188. Ocala, Fla.	**3**	**5**	**3**	**2.6**	**21.0**
189. Monroe, Mich.	4	1	0	2.7	17.5
190. So. Portland, Me.	2	1	0	2.7	8.2
191. Astoria, Ore.	2	2	2	2.7	16.3
192. East Moline, Ill.	2	0	0	2.8	13.3
193. Naugatuck, Conn.	2	0	1	2.8	10.4
194. Monterey, Calif.	3	1	6	2.9	13.8
195. Winnetka, Ill.	2	0	0	3.0	15.3
196. Conneaut, Ohio	2	0	0	3.0	19.6
197. Brawley, Calif.	2	2	1	3.0	14.9
198. Livermore, Calif.	2	0	0	3.0	15.9
199. Escanaba, Mich.	**2**	**3**	**4**	**3.1**	**13.2**
200. Kennewick, Wash.	3	0	0	3.1	21.9
201. Albert Lea, Minn.	3	0	0	3.2	22.2
202. Grosse Pt. Wds., Mich.	2	0	0	3.3	11.6
203. Salisbury, N. C.	5	1	4	3.3	23.8
204. Dyersburg, Tenn.	2	0	0	3.3	18.3
205. Orange, Calif.	4	3	4	3.4	18.8
206. Watertown, Conn.	1	0	0	3.4	9.3
207. St. Augustine, Fla.	3	2	1	3.5	20.5
208. Ecorse, Mich.	2	0	3	3.5	11.2
209. River Forest, Ill.	2	1	1	3.6	17.4
210. Windsor, Conn.	**2**	**5**	**3**	**3.7**	**13.4**
211. Owosso, Mich.	4	2	1	3.8	24.5
212. Grosse Pte. Pk., Mich.	2	1	1	3.8	13.2
213. Stoughton, Mass.	2	0	2	4.1	14.5
214. Beacon, N. Y.	2	0	1	4.2	13.3
215. Hawthorne, N. J.	3	0	0	4.3	18.9
216. Sault Ste. Marie, Mich.	3	1	2	4.3	16.8
217. Windham, Conn.	**3**	**4**	**2**	**4.5**	**18.9**
218. Needham, Mass.	3	1	0	4.5	13.9
219. Rialto, Calif.	**3**	**6**	**—**	**4.6**	**19.5**
220. Rye, N. Y.	3	0	1	4.7	22.2
221. Ansonia, Conn.	3	0	1	4.8	15.2
222. Van Wert, Ohio	3	0	0	4.9	25.4
223. Martinsburg, W. Va.	5	1	1	5.3	30.3
224. So. Milwaukee, Wis.	4	1	1	5.6	25.6
225. Berkeley, Mich.	5	0	0	5.6	20.9
226. Las Cruces, N. M.	5	1	1	5.7	30.9
227. Springfield, Twp., Pa.	3	0	0	5.8	26.3
228. Napa, Calif.	11	5	0	5.9	70.1
229. Lake Worth, Fla.	9	0	3	6.0	58.8
230. Ridgefield Pk., N. J.	3	1	1	6.7	21.4
231. Watertown, Wis.	5	0	3	6.8	38.5
232. Wethersfield, Conn.	5	2	1	7.2	30.5
233. Redlands, Calif.	9	2	3	7.3	42.3
234. Cudahy, Wis.	4	1	2	7.6	31.7
235. Calumet City, Ill.	7	4	3	7.9	35.0
236. Groton, Conn.	**4**	**5**	**2**	**8.3**	**18.3**
237. Darien, Conn.	6	2	6	9.8	40.3
238. Southington, Conn.	5	4	2	10.8	38.2
239. Stonington, Conn.	**2**	**4**	**2**	**12.3**	**12.2**
240. Killingly, Conn.	5	2	2	14.7	42.0
241. Niles, Ill.	8	0	1	16.0	57.6
242. Enfield, Conn.	**2**	**4**	**2**	**19.0**	**8.7**

CANADIAN CITIES

Toronto, Ont.	119	65	63		9.2
Vancouver, B. C.	36	43	25		10.4
Hamilton, Ont.	25	25	15		12.0
Montreal, Que.	147	127	119		14.4

HOW RAILROADS BACK THE ATTACK ON TRAFFIC ACCIDENTS

by Jack C. Trimble

OUR American railroads, transportation industry pioneers in traffic safety work, are in the forefront of the great battle to make the Action Program for Traffic Safety work.

- They are getting to their employees and a large segment of the public with a steady flow of traffic safety education materials —films, publicity, leaflets, posters, radio and TV spots and demonstrations.
- They are taking an active part in the work of state and local safety councils — providing financial backing and aggressive and intelligent leadership.
- They are backing up public officials who have the awesome responsibility of preventing accidents and improving traffic flow.

What they are doing at the grass roots by steady push, and without fanfare, should serve as a pattern for other industries.

Here are some of the things they are doing, and comments by a few of the safety supervisors who direct this work.

The Denver and Rio Grande Western is typical of the many railroads which are making outstanding contributions to traffic safety. R. S. James, safety superintendent and new chairman of the NSC Railroad Section's Highway-Railroad Crossing Committee, says:

"Most of us in railroad safety work realized years ago that we had to broaden our efforts to include traffic and other off-the-job safety activities because of our responsibility to our workers and our obligation to the communities which we serve.

"It isn't good business to spend thousands of dollars training a man and preaching safety to him in our shops or on our trains and then send these engineers, brakemen, or skilled shop workers into streets in a community where the driving habits of their neighbors are so bad they can get them killed." He continued:

"We are working to prevent this. We teach him traffic safety on the job —keep up a steady barrage of reminders to walk and drive safely. And we don't stop there. We go into communities and work with safety councils and city officials, when invited, in an effort to help improve local traffic conditions. In many communities we have assisted with the formation of needed safety councils," he said.

John Slaven, superintendent of safety for the Chicago, Burlington and Quincy, says:

"You have to be dedicated to safety to handle this job well. It's not an eight hour day, five day week operation. We preach railroad safety and traffic safety at every opportunity."

"Our protective and safety people, and employees of all departments, are constantly alert for unsafe and unlawful driving acts of motorists at railhighway crossings. They work closely with state and local enforcement officials in warning drivers of their mistakes which could be fatal if repeated.

"We have found that business men and school officials are most cooperative when unsafe driving practices by their drivers are brought to their attention. This is a continuing program which I believe has prevented many tragic accidents."

L. C. Hahney, safety director for the Elgin, Joliet and Eastern, says:

"The railroads were active in the organization of the National Safety Council back in 1912, and there have been Railroad Section meetings at every National Safety Congress since 1915. We have taken the leadership in traffic safety work because we have by tradition an ingrained sense of responsibility for the welfare of our workers and the public. Our objective is to instill in everyone realization of the importance of making safety a personal matter."

In addition to their own extensive traffic safety work, the railroads, working with the National Safety Council, conduct the nationwide Signs of Life program. Its purpose is to inform motorists and pedestrians of the meanings of street and highway signs, signals and pavement markings, and to drive home to them the importance of obeying all traffic signs at all times. Obedience of highway-railroad crossing signs is particularly stressed.

The program embodies the combined efforts of the railroads of the United States and Canada, and national, state and local traffic officials, safety councils and other public support groups and civic agencies.

It has two basic goals:

- To stimulate prompt recognition of the signs and markings and to encourage complete obedience to them and to the common sense safety rules they represent.
- To encourage public support of a program of maintenance, modernization and standardization of signs, signals, and markings

The author is Secretary of the Council's Highway-Railroad Crossing Committee.

and upgrading police and court supervision of those who fail to obey.

Results achieved through the national program in reducing highway-railroad traffic accident deaths are impressive. These have dropped from 6.1 per cent of total traffic deaths in 1945, to 3.3 per cent in 1956.

The over-all program, apart from highway-rail accidents, has also contributed in some measure to the general reduction in the fatality rate in the same period. However, the extent of the results is less measurable.

"The remedy for accidents resulting from disregard of traffic signs, signals and pavement markings is known," said George Dempsey, assistant superintendent of safety for the Chicago, Milwaukee, St. Paul and Pacific, and vice-chairman of the Highway-Railroad Crossing Committee. "But getting the public to apply the remedy is not an easy task. A continuing public education program must therefore be conducted," he said.

The railroads get their traffic safety message across to their folks and to citizens in towns they serve in many different ways.

The B&O makes special checks of driver behavior at highway-railroad crossings, according to Superintendent of Safety G. W. Elste. During 1956 there were 187,269 such observations made by personnel of the road. They discovered that 9,100 drivers, 4.86 per cent, failed to observe safe crossing rules. These motorists were sent a notice telling them what they had done and urging them to pay closer attention to the Signs of Life in the future. The title of the notice sent out reads: "A Friendly Tip About a Slip That Could Have Been Serious."

The St. Louis-San Francisco conducts more than 50 family group meetings each year with an attendance of more than 30,000 persons.

"In this type of meeting the family attends as a unit and participates in an atmosphere of friendship and informality," said Roy P. Hamilton, superintendent of safety. "Programs are designed to interest and reach every member of the family from father to the youngest child. Entertainment and refreshment are provided.

"All families in areas served by the road are invited to attend. Many mayors and city managers proclaim a safety week in their city during the week the meetings is held," he said.

Frisco has also introduced the use of family group safety picnics as an excellent way to offset lagging interest in safety during hot summer months.

The Texas & Pacific has an outstanding safety program directed by J. H. Williams. Several years ago the Safety Department encouraged the organization of Ladies Safety Councils at terminal and shop points where a large number of their employees lived. These organizations were formed into what are now known as the T & P Ladies Safety Councils. There are 12 such organizations located in communities from El Paso to New Orleans with a membership of more than 2,000 women.

"The original plan was to enlist members in the continuing task of interesting all T & P families in traffic

To Page 56

"DRIVE WITH CARE—EVERYWHERE"
Union Pacific R.R. Backs the Attack on Traffic Accidents by carrying the above message on cabooses.

LOUISVILLE-NASHVILLE R.R. BACKS THE ATTACK
L&N railroad safety officials discuss R.R. safety with the Junior Safety Council of Nashville, Tenn.

HOW TRUMBULL COUNTY EARNED SAFETY-CHECK GRAND AWARD

Organization and imagination help Ohio county sell program to 35,000 motorists — checks turn up thousands of unsafe conditions

by M. R. Darlington, Jr.

FOLKS in Trumbull County, Ohio, will tell you "the proof of the pudding is in the eating." They've had three generous servings of self-administered traffic safety in the past three years and they're stirring up an even bigger helping for 1958. In Warren, and the surrounding communities in northeastern Ohio, the "pudding" is their annual Vehicle Safety-Check.

Last May, in their annual voluntary safety-check, the Trumbull County Chapter of the Governor's Traffic Safety Committee went all-out to show county motorists the importance of driving safe cars. New car dealers, garages, service stations—a total of 111 automotive businessmen—offered free safety-checks during the month of May. Then, during "Safety-Check Week," check lanes were set up in every city and township in the county. A parade, a queen and a flying "sound-truck" were used to call attention to the community program.

Proof of the pudding? Motorists ate it up. They flocked to the check lanes. More than 35,000—half of the county's registered vehicles—received free 10-point checks for safe driving condition. In 5,000 cases mechanics detected some unsafe operating condition. Nearly 40 per cent of the vehicles thus discovered were repaired and returned to the check lanes for a re-check and the official windshield sticker showing they had passed the test. Thus, about 2,000 cars and trucks had unsafe conditions discovered and corrected before they had a chance to become a factor in a traffic accident.

Trumbull County's Safety-Check earned the grand award from national sponsors as the most outstanding single county safety-check program in the nation.

How did they do it? How did they reach so many people with the traffic safety message?

M. R. Darlington, Jr. is managing director, Inter-Industry Highway Safety Committee, and chairman, Traffic and Transportation Conference, National Safety Council.

OFFICIALS of the Standard Steel Spring Division of Rockwell Spring and Axle Co. get their cars inspected at safety-check lanes set up outside plant gate. Trumbull County Safety Chapter sponsors the free inspections.

They were well organized, they worked hard and they used imagination!

The Trumbull County Chapter of the Governor's Traffic Safety Committee started talking about their 1957 safety-check at their January meeting. Paul Vencel, a Warren tire dealer and president of the chapter, had been a sparkplug in the 1955 and 1956 safety-checks and he knew the importance of an early start. He appointed Robert L. McGarry, an insurance man, as county safety-check chairman. The two of them, along with Jim Waldron of the Packard Electric Division of General Motors, a past president of the group, and Herbert J. Webb, a retired Newton Falls businessman, who is the hard-working secretary of the chapter, got things underway.

Before the February meeting of the Trumbull County Chapter, people representing every community in the county had been asked to serve as safety-check chairmen for their city or township. A representative of the Inter-Industry Highway Safety Committee—a national sponsor of the program along with *Look* Magazine—spoke to the assembled chairmen during the March meeting.

Following the business session they saw an actual safety-check demonstrated. Ninety people from every section of the county and all walks of life were present. For example, in Cortland the chairman was Chief of Police David H. Murphy. In Fowler it was Ralph Rathburn, who runs the Standard Oil station. Gerald Vasbinder, the justice of the peace, was chairman in Mesopotamia. So it went in every community in the county. A final briefing was held for city and township chairmen on April 10.

Meetings were also held with car dealers, garage owners, and service station operators to explain methods used in checking brakes, front and rear lights, steering, tires, exhaust system, glass, windshield wipers, rear view mirror and horn.

Many businessmen called chapter officers to offer their help. Mechanics were loaned to do the actual checking. Volunteers were recruited from civic clubs to keep records at the check lanes. Insurance agencies and other businesses gave financial support. The Lordstown Military Reservation and

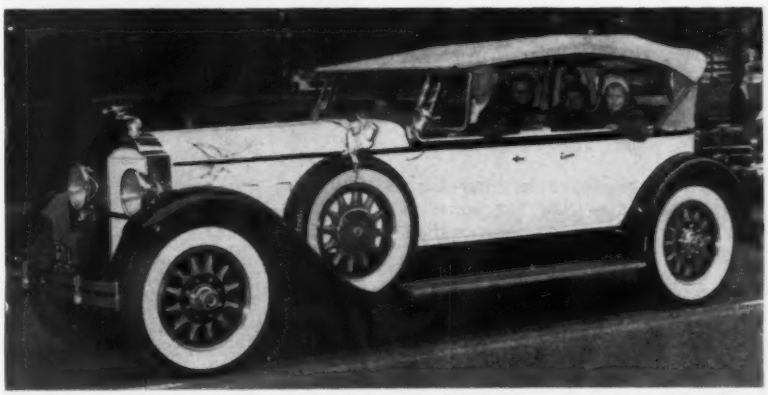
To Page 63

PROMOTIONAL STUNTS

LORDSTOWN MILITARY RESERVATION
BACK THE ATTACK
ON TRAFFIC ACCIDENTS
YOU, TOO! CAN BACK THE ATTACK. HAVE YOUR VEHICLE SAFETY CHECKED
U.S. ARMY
IC 6456

THIS MOVING BILLBOARD from the Lordstown military reservation told how the Army backed the attack in the Trumbull County safety check.

PILOT AND SAFETY OFFICIALS talk over plans before flight over Trumbull County with loud speaker announcing the safety-check.



ANTIQUE CARS appeared in safety parade boasting of their excellent mechanical condition. All passed the 10-point vehicle safety-check.

GENERAL MOTORS LAUNCHES

AIM TO LIVE PROGRAM

"AIM TO LIVE!" That's General Motors Corporation's nationwide campaign for better vision on the nation's highways in 1958, recently announced by GM's President Harlow H. Curtice to help reduce the excessive night driving toll which last year took more than 20,000 lives.

General Motors is enlisting the aid of its 19,000 car and truck dealers plus thousands of independent garages and service stations in the drive to promote safety-aimed headlights for all makes and models of cars and trucks.

"With the ever-increasing number of cars and trucks on our streets and highways," Mr. Curtice declared, "there must be action now to protect motorists and pedestrians alike with the best headlighting possible at night.

"The need for decisive action is implicit in the fact that driving at night is three times as dangerous as during the day, yet more than half the cars on the road today have headlights which are not correctly aimed."

The General Motors "Aim to Live" campaign is directed at:

1. Urging every motorist to have his headlights aimed immediately and then have them regularly inspected twice a year.

2. Encouraging motorists to observe the "dimming" rule on streets and highways.

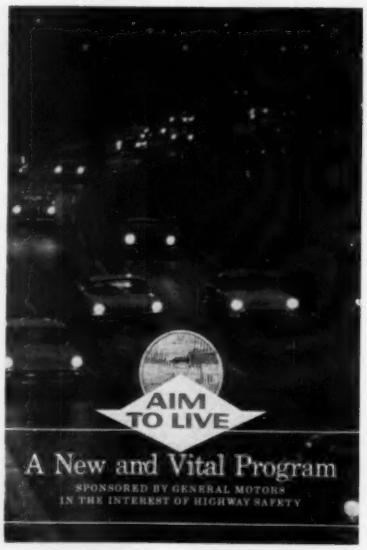
3. Alerting drivers to limit their speed at night so they can come to a safe stop in the vision distance their headlights afford.

In addition to the garage, service station and dealer servicing of headlights, General Motors will promote a broad educational and informational program on the hazards of night driving, offering tips on night driving safety via pamphlets and posters, films and speakers, millions of pieces of direct mailing to motorists, and public service advertisements on night safety. A pamphlet that can be inserted in driver training kits in schools will also be distributed.

GM also is advising all top safety authorities, civic and business leaders, government officials and traffic experts of the night safety campaign. Service clubs, school and safety groups will be urged to emphasize night safety in their traffic campaigns.

"I urge every motorist to join this 'Aim to Live' campaign," Mr. Curtice said. "Properly aimed headlights, together with correct dimming habits and alert driving, can help stem the loss of so many lives on our highways at night."

The tremendous potential in saving of human life can be measured by the fact that if the night accident rate could be cut to the daytime average on miles driven, "we would save 15,000 lives a year," Mr. Curtice stated.



8-page brochure outlines General Motors headlighting safety program for nation.

He pointed out that the critical need for proper headlight aiming of all cars was recognized at last September's annual meeting of the American Association of Motor Vehicle Administrators.

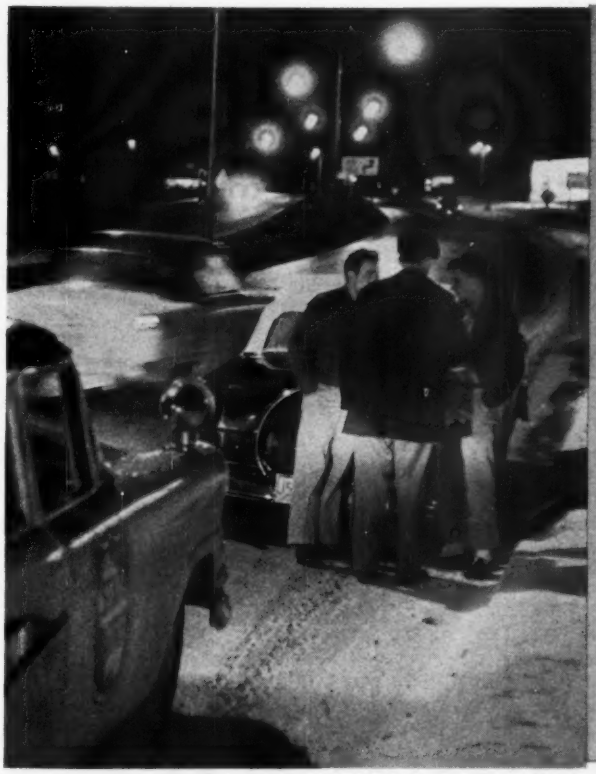
These state officials stressed in a resolution "the importance of proper headlight aim" and re-emphasized the "need for regular inspection of aiming."

Better night vision has been a matter of vital concern to General Motors and the rest of the industry for many years, Mr. Curtice said. Many years of research preceded adoption of the sealed beam headlamp in 1940, a significant advance in night safety. Similar research produced the four-lamp system now standard on General Motors cars. The four-lamps increase driver vision by at least 15 per cent.

Regardless of whether cars are equipped with two or four headlights, Mr. Curtice said, all should be checked for adjustment at least twice a year. Although headlight aim is checked on all new cars, he explained, normal road shock, impacts while parking and "settling in" of suspension systems can vary the aim at the headlamp by a fraction of an inch.

This fraction can mean lights aimed too far to either side, or too high or too low for safe vision. Up to 80 per cent of the light needed for safe driving is lost under these conditions.

"We owe it to ourselves, our families and our neighbors to 'Aim to Live'," Mr. Curtice declared. "Sparing minutes for headlight aiming now might spare lives later."



BACK THE ATTACK WITH MAY VEHICLE CHECK PROGRAM

Detection and repair of cars in poor mechanical condition can help cut the traffic accident toll in your community. Smoke out these sneak killers with a periodic vehicle safety check.

WHEN all the facts concerning a fatal traffic accident are uncovered, one of the following tell-tale items often comes to light:

Brakes didn't hold
Windshield wiper out of order
Defective headlights
Tail light not working

Some of them seem trivial enough on paper. For instance, the ailing windshield wiper seems more like an inconvenience than a major danger. Yet, to countless motorists and pedestrians a faulty windshield wiper has spelled D-E-A-T-H.

Take the case of Sam Sloan. Sam was driving home from the office one evening last month. He'd put in a little overtime and it was dusk when he started out—raining, too.

About half way home the rain turned into a downpour—and that was when it happened!

A car on an intersecting street zoomed through a stop light straight into the side of Sam's car—the driver's side. Sam never knew what hit him.

Ironically, the other driver was just shaken up and scratched.

His explanation? "It wasn't my fault. My windshield wiper konked out. I didn't see the stop light or the other car."

Actually, this man had had trouble with the windshield wiper before. He had meant to get it fixed but just kept putting it off. Yet he said, "It wasn't my fault!" He didn't realize that he was responsible for his car's deficiency!

This attitude is far too prevalent among drivers. They fail to acknowledge that they have a moral responsibility to keep their vehicles in safe driving condition.

Your job during May is to conduct a Vehicle Maintenance program that will (1) make drivers acutely aware of this responsibility and (2) give them ample opportunity to fulfill it. Such a program will be a powerful weapon in your attack on traffic accidents.

The first objective will be achieved if you conduct an intensive educational campaign that will make drivers see the relationship between such things as broken windshield wipers and broken bodies.

The second objective will be achieved if you provide some form of vehicle check program which will either force or persuade them to have a periodic professional safety vehicle check.

VEHICLE MAINTENANCE

Operation Safety Theme for May

Local Conditions Dictate Plans 38

Poor Maintenance—Widespread Problem . . 42

May Program Aids 44

Free Operation Safety Materials 44

Posters, Leaflets, Booklets 45

LOCAL CONDITIONS DICTATE VEHICLE MAINTENANCE PLANS

Periodic official inspection of motor vehicles for safe driving condition is widely recognized as desirable.

The Uniform Vehicle Code and the Action Program of the President's Committee for Traffic Safety both recommend it.

It is one of the objectives of the Back the Attack on Traffic Accidents campaign.

In 1956 the Governors Conference Committee on Highway Safety recommended that each state establish a vehicle inspection program as soon as the other elements of an adequate over-all program have been developed and public support secured. The recommendation was repeated in 1957.

At the Public Officials Traffic Safety Conference held in Washington, D. C., last December the workshop on laws and ordinances declared a compulsory motor vehicle inspection law in every state to be "one of the most needed pieces of legislation."

In a recent Gallup Poll, 74 per cent of the driving public interviewed was in favor of car inspection twice a year. (Survey conducted by American Institute of Public Opinion, released July 7, 1957.)

Teen-agers—America's new drivers—have recommended state or municipal motor vehicle inspection at 27 per cent of their own traffic safety conferences.

Despite this overwhelming endorsement, only 14 states and the District of Columbia now have periodic motor vehicle inspection. Last year proposed legislation of this nature was rejected by the legislatures of 13 states.

During May the annual Vehicle Maintenance program will focus nationwide attention on the important subject of vehicle condition. This would be a good time for communities in states which have adequate overall accident prevention programs, but lack official inspection legislation, to initiate action for such legislation.

A community can start the ball rolling by having local officials contact the governor or the state coordinator, either of whom will know why the motor vehicle inspection legislation is lacking and will be able to tell the local group how to work for the desired legislation. The state coordinator can enlist the support of state organizations and, through them, a statewide campaign can be planned.

Information on official inspection of motor vehicles, including a discussion of various types of inspections systems, is given in Public Safety Memo 21—Periodic Motor Vehicle Inspection. Single copies are available free from the National Safety Council.

In communities which do not have official inspection, either a police spot-

check program or a voluntary vehicle-check program should be undertaken.

In a police spot check the local police department conducts an emphasis program on vehicle maintenance. This may be done in several ways.

Sometimes the police will erect a road block and will stop a representative number of vehicles approaching this block. A similar method—but one which has the advantage of not interfering so much with traffic—is one in which the checks are made in a parking lot. Cars are then stopped on the street but pull into the lot for the actual inspection.

Less obvious, but more inclusive, is the inspection conducted by the entire traffic patrol. When this is employed each member of the traffic patrol makes frequent spot checks in the course of his daily routine. He may stop a car at any time and ask the driver to permit a safety check.

Voluntary Check

The practice of having an annual voluntary vehicle safety check program is becoming increasingly popular. This year as in 1957, vehicle check programs will receive added impetus from the Back the Attack campaign.

Most communities schedule this check in May to tie in with the nationwide Operation Safety Vehicle Maintenance program of the National Safety Council and the National Vehicle Safety-Check for Communities program sponsored by the Inter-Industry Highway Safety Committee and Look Magazine.

The voluntary vehicle safety check program is conducted by the local safety group in close cooperation with local officials. It requires efficient organization and the participation of all community leaders and organizations. When properly conducted it can be a vital force in bringing about community-wide traffic safety consciousness. In many communities it has convinced the public of the need for periodic vehicle checks, and thus generated the necessary public support for official periodic inspection programs.

The first step in a successful vehicle-check program is to discuss the idea with your officials and then to sell all community organizations on the benefits of the program. This selling job can best be done by a carefully selected group of top men in the community (already pre-sold by you) who actively support and back the campaign. Possibilities would be the mayor, a leading merchant, a leading manufacturer, a representative of the local clergy and the head of an inter-club council or leading civic group.

This group should also determine the scope of the program and the projects best suited to the community, call in available state or national safety people to address meetings and serve in an advisory capacity, and select a safety check committee composed of representatives of all important businesses and official and non-official groups in the community to run the program.

Inspection Methods

The actual inspection may be carried out in one of three ways: (1) by officials at temporary check lanes or stations; (2) by a commercial company having the necessary equipment —many companies would appreciate the public relations value of offering such a service, and (3) by cooperating garages or automobile dealers who could give estimated cost of needed repairs.

Each car checked should receive a sticker identifying its owner as a participant in the program. Use and placement of the stickers should be in accordance with requirements for such items in the state vehicle laws and be approved by local police officials.

Complete information on the National Vehicle Safety Check for Communities — including detailed instructions on planning the program and setting up check lanes—is available

ALTERNATE PROGRAM FOR MAY
Bicycle Safety

In communities in which the official vehicle maintenance program is well established it may be desirable to conduct an entirely different program during May.

A bicycle safety program would be a good choice because it would tie in well with the vehicle maintenance program—publicity for one program would supplement publicity for the other.

Public Safety Memo No. 92—Bicycles—contains the materials needed for such a program. It gives general information on the bicycle safety problem and outlines four specific programs. One copy of Public Safety Memo No. 92 is available free from the National Safety Council. Booklets, posters and other aids are also available at nominal prices.

A PARADE is a good kick-off event, but it must be carefully planned with local police department.

CHECKING OF headlights for aim of beams and clarity of lenses is important item in vehicle check.

USE AND placement of sticker must be in accordance with requirements in state vehicle laws and be approved by local police. Here is how it was done in award-winning Trumbull County (story on page 34).

from National Headquarters, National Vehicle Safety-Check for Communities, 1200 18th Street, N.W., Washington 6, D. C.

Planning Your Program

Just how you will conduct your vehicle maintenance program depends entirely upon your local situation. But regardless of the type of program you have, you will be responsible for explaining it to the public and securing wholehearted public support. It will also be your job to fit it in smoothly with the local Back the Attack on Traffic Accidents campaign.

If periodic motor vehicle inspection is required by law in your area, your publicity should be directed toward supporting the administration of the law—by furthering public understanding of the need for the vehicle check and by urging enthusiastic cooperation with officials. Your job will be substantially the same if the official check is carried out on a spot check basis.

If vehicle inspection in your locality is on a voluntary basis, your job will be more difficult. Then you must conduct an educational campaign on vehicle maintenance and must also either spearhead the actual check program or cooperate closely with those who are conducting it.

Publicize!!!

All lines of communication should be used to promote the vehicle maintenance program. Publicity in newspapers, on radio and TV should start as soon as program plans get underway and should continue throughout the campaign. There should also be follow-up stories to publicize the results of the campaign.

In general, your publicity should convince the driver of the need for good vehicle maintenance and should educate him regarding the 10 safety check points: brakes, headlights, rear and stop lights (including turn signals), steering, tires, exhaust system, glass, windshield wiper, rear view mirror, and horn. It is important to impress upon the owner that a periodic professional inspection is not enough —that he must constantly check the vital points himself. You will find background material for this publicity in the statistics and list given on pages 42 and 43.

Campaign publicity should also re-

mind the motorist that he has a moral responsibility to drive a safe car—that his safety and the safety of all he meets in traffic depend upon him.

Call upon your local clergy and church groups to help you publicize this aspect of the program. They can get the point across in sermons, in articles in church publications, by distributing literature at church group meetings. They can also take part in community projects such as radio and TV panels, write articles for local newspapers, speak before civic and business organizations.

Use Prominent People

Capitalize on the endorsement of or participation in the program by local or visiting VIP's. Interviews with these people in the newspapers, appearances on radio and TV, news pictures of them taking their cars through the check lanes can help to sell the average driver on the program. Such people could include the mayor; local government officials; social, business, civic, and religious leaders; prominent local athletes; visiting celebrities.

Two groups upon whom you can count for support are the local representatives of the automotive industry—garages, service stations, automobile dealers, accessory and equipment dealers—and local truck, bus and taxi companies and other fleet owners.

The former can display vehicle maintenance posters at their places of business, distribute literature, and remind patrons to have a 10-point safety check. Their personnel can also help man check lanes if your program is a voluntary one.

A current campaign by one of the automotive industry's leaders ties in well with the vehicle maintenance program. It is General Motors "Aim to Live" campaign, which is designed to encourage the public to reduce nighttime traffic hazards by proper aiming and inspection of headlights and by safe night driving practices.

Drivers of ambulances, taxis, police squad cars, trucks and buses who have safe driving records are an excellent source of publicity. Interview them on TV and radio and in the newspapers. In the interviews point up the rigid standards of mechanical efficiency to which their vehicles must conform.

Scouts Can Help

Each year the Boy Scouts figure prominently in the vehicle maintenance programs of many communities. During May they will still be emphasizing traffic in their 1958 Safety Good Turn.

You can find many projects for which they are especially well suited in the vehicle maintenance program. Distributing literature at check lanes, meetings and from door to door . . . organizing a safety-check phone campaign . . . attaching bumper strips . . . erecting safety displays in store windows and at outdoor locations are a few of the activities in which they might engage.

Call On Teens

Teen-agers, too, can help. They are credited with an important role in many 1957 Community Vehicle Safety Check programs.

In Indianapolis they helped police officials arrange for a roving check lane to visit each city high school for one day. In Great Bend, Kansas, they washed car windshields at service stations and urged motorists to take their cars through a city check lane. Students at El Rancho High School in Rivera, California, conducted their own Safety Check of 193 cars.

Your speaker's bureau will be an important arm of the Vehicle Maintenance program. In choosing speakers, look for people the public will readily associate with car care. Police or patrol officers, bus and trucking company safety directors, and automobile dealers are some of the people who can talk authoritatively on this subject.

As to audiences, wherever there are people there are car drivers and owners. And every car driver should know the ABC's of car care. Every adult meeting would provide a suitable audience for a short talk on vehicle care.

BOY SCOUTS can do a good job of selling the vehicle check program via a phone campaign. Cub's mother helps out here.

ANOTHER PROJECT for Scouts is distribution of literature at check lanes, service stations, meetings, and other outlets.

POOR VEHICLE MAINTENANCE WIDESPREAD TRAFFIC PROBLEM

Accident records and findings of official and voluntary inspection programs show many motorists are driving potential death traps.

STATISTICS indicate that a number of the motor vehicles involved in traffic accidents each year are found to have unsafe conditions which contributed to the accident.

Unfortunately, these statistics give a far from complete picture of the role played by unsafe vehicles in the traffic toll.

This is mainly due to the following reasons: (1) It is often impossible to determine pre-existing repair needs after a car has been smashed in a collision. (2) The accident records of many states do not require a report on the condition of vehicles involved in an accident.

However, the record does show that many motorists are driving potential death traps.

- In 1956, eight per cent of the fatal traffic accidents involved one or more vehicles faulty in at least one respect, according to reports from 23 states.
- Five per cent of all vehicles involved in fatal accidents, where condition was reported, had some unsafe condition.

The following table shows the most prevalent conditions.

Condition of Vehicle	Average Percentage
Unsafe brakes	2
Improper lights	1
Blowout or unsafe tires	1
Other unsafe conditions	1

These figures concern only vehicles involved in fatal accidents. The percentages do not apply to all vehicles on the street or highway. It is not known what proportion of all vehicles have some unsafe condition.

However, reports from states conducting official vehicle inspection programs show that a high percentage of vehicles inspected are rejected because one or more parts affecting safe driving condition require immediate service attention.

New Jersey, which has required motor vehicle inspection since 1938, reports that each year approximately 35 per cent of the vehicles examined are found to have one or more unsafe conditions.

Results of the voluntary National Vehicle Safety-Check program also show that many of the cars on the road are in need of maintenance attention. One out of every five vehicles safety-checked in this program in 1957 was found in need of maintenance attention for safe driving. The table below gives an itemized list of the program's findings.

RESULTS OF 1957 NATIONAL VEHICLE SAFETY-CHECK PROGRAM

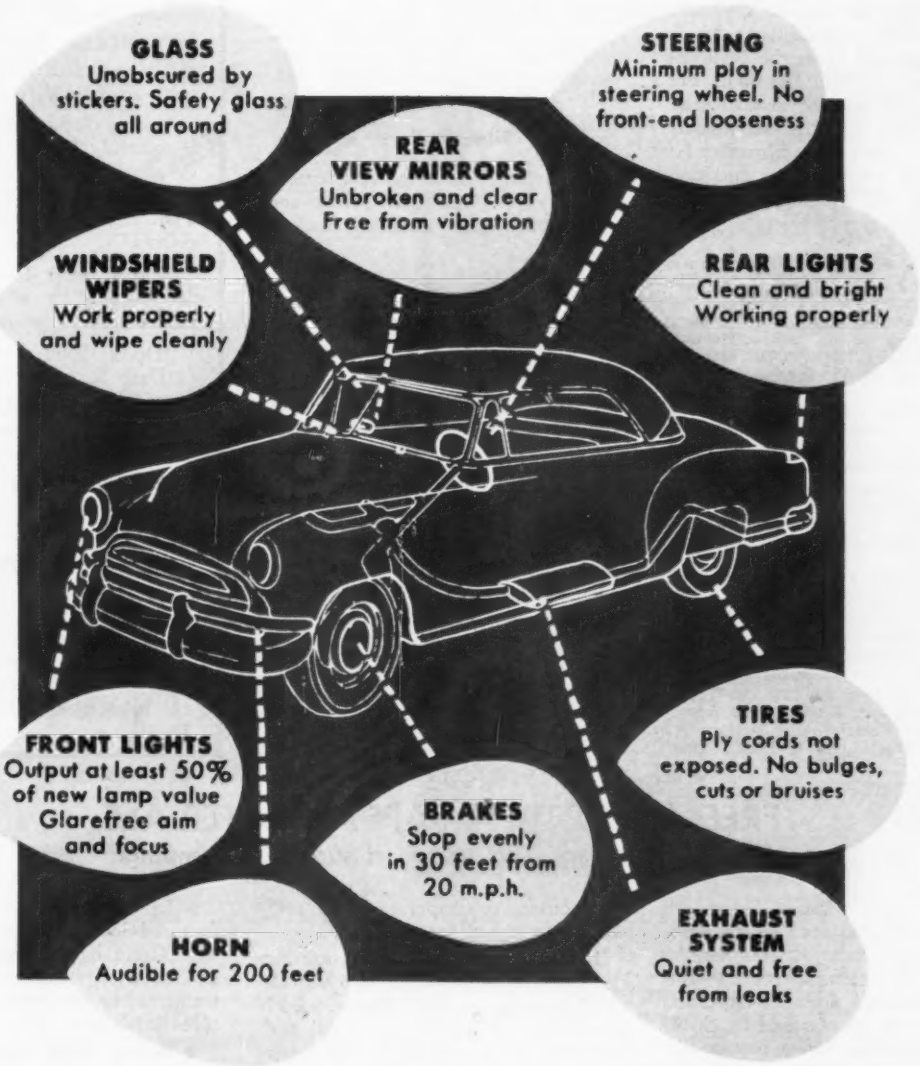
Condition of Vehicles Itemized

Items of vehicles safety-checked by type and the percentage of each to the total number of parts in need of maintenance attention are shown in the following table:

ITEMS CHECKED	Cars		Trucks		Total	
Rear Lights	84,827	23.6%	10,928	27.9%	95,755	24.0%
Brakes	69,593	19.4	6,438	16.4	76,031	19.1
Front Lights	61,282	17.0	5,582	14.2	66,864	16.8
Exhaust System	38,138	10.6	3,324	8.5	41,462	10.4
Tires	29,982	8.3	2,165	5.5	32,147	8.0
Steering	24,304	6.8	2,298	5.8	26,602	6.7
Windshield Wipers	21,111	5.9	2,612	6.6	23,723	5.9
Glass	16,652	4.6	2,706	6.9	19,358	4.8
Horn	9,522	2.6	1,567	4.0	11,089	2.8
Rear-view Mirror	4,236	1.2	1,668	4.2	5,904	1.5
	359,647	100.0%	39,288	100.0%	398,935	100.0%

The above itemized breakdown is based on the following reported vehicles checked and rejected: 1,360,968 cars checked. 271,321 cars rejected. 91,693 trucks checked. 24,265 trucks rejected. (Of these, 150,827 cars and 13,491 trucks were reported corrected and rechecked.)

10 POINTS IN SAFETY CHECK


GLASS
Unobscured by stickers. Safety glass all around
STEERING
Minimum play in steering wheel. No front-end looseness
REAR VIEW MIRRORS
Unbroken and clear Free from vibration
WINDSHIELD WIPERS
Work properly and wipe cleanly
REAR LIGHTS
Clean and bright Working properly
FRONT LIGHTS
Output at least 50% of new lamp value Glarefree aim and focus
TIRES
Ply cords not exposed. No bulges, cuts or bruises
BRAKES
Stop evenly in 30 feet from 20 m.p.h.
HORN
Audible for 200 feet
EXHAUST SYSTEM
Quiet and free from leaks

These are the 10 vital points that must be checked in every professional vehicle maintenance inspection. Give them wide publicity. Also remind drivers to supplement the periodic professional inspection with frequent checks of their own.

MAY PROGRAM AIDS

Films, booklets and other aids for your Vehicle Maintenance program

THE films listed below were selected from the *National Directory of Safety Films* (1956 Edition), which may be purchased from the National Safety Council (Price: $1.00). For local film sources write to your state and local safety councils, state safety departments, the film libraries (if any) at your state colleges and universities and the film department of your state library.

EVERY 1,000 FOR SAFETY (16mm sound motion) col. 13 min. 1954. The film stresses safety factors in having car lubricated every 1,000 miles and checking for safety during the job. Sinclair Refining Co., Merchandising Dept., 5 W. 48th St., New York 20, N. Y. Purchase or loan.

SAFE DRIVING: CAR MAINTENANCE AND CARE (16mm sound motion) b&w or col. 10 min. 1955. How young driver learns simple non-mechanical techniques of preventive car maintenance to insure safe performance of his car. Coronet Instructional Films, 65 E. South Water St., Chicago 1, Ill. Purchase or rental.

ONE WAY LEFT (16mm sound motion) col. 24½min. 1955. Shows how a State Representative found out about the need for periodic motor vehicle inspection. The film tries to convince viewers of this need in every state to reduce accidents and obtain a more adequate highway safety program. Sponsored by the American Association of Motor Vehicle Administrators, 912 Barr Bldg., Washington 6, D. C. Loan.

WILL YOU COME BACK? (16mm sound motion) b&w or col. 11½ min. Cleared for TV. Gives typical driver unsafe attitudes and the need for good brakes. Sponsored by American Brakeblok Div., American Brake Shoe Co., 4600 Merritt Ave., Detroit 9, Mich. Loan.

Film Trailers

One minute film trailers prepared especially for Operation Safety and the National Safety Council, include the following:

DON'T CROWD YOUR LUCK (16mm or 35mm sound motion) b&w. Designed to remind the general public of an old safety formula: Today's inspection of your car is tomorrow's protection—for your life as well as your good times. Cleared for TV. (OST—1—8)

TIME TO LIVE (16mm or 35mm sound motion) b&w. Tells the story of little Johnny, who forgot to check the brakes on his pushmobile and crashed into a tree. His father forgot the same thing on his car and died. Cleared for TV (OST—1—515)

Publications

Public Safety Memo No. 21—Periodic Motor Vehicle Inspection. Ten pages of information on motor vehicle inspection systems. Available from National Safety Council. Single copies free.

Safety Good Turn

MAY is the final month of the Spring traffic phase of the Boy Scout Safety Good Turn. The following program items (as illustrated on the opposite page) have been prepared especially for the Scout campaign.

"Boy Scouts Go All Out for Safety"—a four-page reprint from *Traffic Safety* magazine.

"Safety Good Turn" Poster—a colorful 17" by 23" poster showing a Scout saluting and saying "Help the Scouts Help You. Be Prepared—Prevent Accidents."

"Do a Good Turn" Bumper Strip—12½" x 4" printed in fluorescent ink on heavy paper.

"Do a Good Turn" Bicycle or Dash Sticker"—miniature of bumper strip 1" x 3".

"Do a Good Turn" Hang-On Tag—For door knobs, car door handles and bottles.

"Do a Good Turn—Wait"—A 4-page, two-color leaflet for drivers and pedestrians.

Sample packets are available from the National Safety Council at $1.00 per packet. For free brochure showing prices, write National Safety Council, 425 N. Michigan Ave., Chicago 11, Ill.

FREE OPERATION SAFETY MATERIALS

Basic aids to help you launch a successful campaign

TO DO the Operation Safety job thoroughly, you need all the tools. News releases, radio scripts, samples of leaflets and newspaper mats—formerly distributed in the Operation Safety kit—can be obtained by checking the Operation Safety box on the Reader Service Card contained in this issue of TRAFFIC SAFETY.

Here's what you get:

▸ **Four News Releases**—designed to feature local personalities and to highlight local conditions. Written by professional journalists, these releases point up the responsibility of each citizen to cooperate in the traffic safety program.

▸ **Four Radio Scripts**—five-minute, interview-type scripts on the Vehicle Maintenance safety theme. Each spotlights an appropriate local personality and is written for easy adaptation to local traffic situations. Scripts are tailored to fit the requirements of local stations.

▸ **Newspaper Mats**—a sample of each of the featured mats on the Vehicle Maintenance theme. Designs are one-column miniatures of the featured poster designs shown on page 45.

▸ **Leaflets**—samples of the three featured leaflets illustrated on page 45. These handy, pocket-size giveaways tell a brief but hard-hitting traffic safety story in a way that captures interest.

▸ **Safety Good Turn Materials**—Hang-on tag, dash and bike sticker.

▸ **Brochure**—Describes how to obtain planning materials telling you how to organize and conduct a successful community Vehicle Safety-Check. Available from the National Vehicle Safety-Check for Communities, 1200 18th St., N.W., Washington 6, D. C.

OPERATION SAFETY MATERIALS

SAFETY GOOD TURN CAMPAIGN MATERIALS

SAFETY GOOD TURN HANG ON TAGS (398.03). Sold in packages of 1,000. Price per 1,000(M): 1M, $5.75; 2M-9M, $3.90; 10M or more, $3.25.

SAFETY GOOD TURN BUMPER STRIPS (398.01). Sold in packages of 100. Price per 100(C): 1C, $13.50; 2C-9C, $11.70; 10C or more, $11.10.

SAFETY GOOD TURN DASH OR BIKE STICKERS (398.02). Sold in packages of 100. Price per 100(C): 1C, $2.90; 2C-9C, $1.75; 10C or more, $1.35.

OPERATION SAFETY PUBLICATIONS

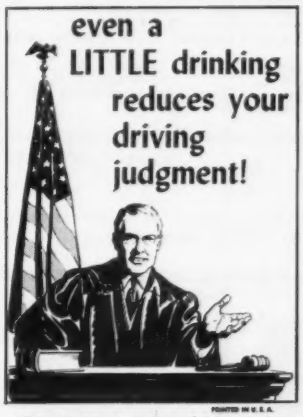
PORTRAIT OF THE MISSING LINK (391.50). Shows how good drivers and good cars make safer roadability.

DO A GOOD TURN—WAIT! (391.45). Promotes good driver-pedestrian relationship and develops good driving habits.

The above two leaflets are sold in packages of 100 and 1,000. Price per 100: $2.50. Price per 1,000(M): 1M-4M, $20.00; 5M-9M, $18.00; 10M-19M, $16.00; 20M-99M, $14.00; 100M-199M, $12.00; 200M or more, $10.00.

BACK THE ATTACK—JOIN UP! (397.11). Encourages drivers to consider the moral responsibility to drive carefully. Sold only in packages of 1,000. Price per 1,000(M): 1M-9M, $6.70; 10M-99M, $5.70; 100M-999M, $5.00; 1,000M or more, $4.50.

OPERATION SAFETY POSTERS FOR MAY POSTING



©NATIONAL SAFETY COUNCIL

T-1315-C 25"x38"
T-1316-A 8½"x11½"

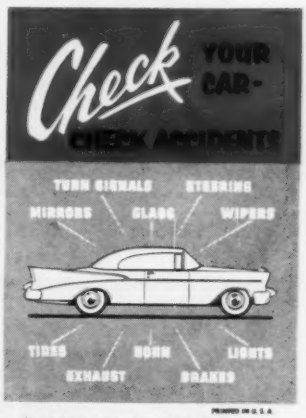
©NATIONAL SAFETY COUNCIL

T-1316-B 17"x23"

ALTERNATE POSTERS FOR MAY POSTING

©NATIONAL SAFETY COUNCIL

T-1010-C 25"x38"
T-1011-A 8½"x11½"



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T-1012-B 17"x23"

PRICES FOR ABOVE POSTERS

Traffic Posters—T-prefix to number

	1-9	10-99	100-999	1000-4999*
A Size	$0.15	$0.092	$0.063	$0.052
B Size	.25	.18	.15	.12
C Size	.35	.27	.22	.20

YOUR CREDIT LINE can be imprinted at time of the press run on Traffic B and C posters only. Orders for imprints must be received by March 15, 1958 for the posters above which are intended for May posting.

Imprinting charges for these posters are $2.25 per lot plus an initial charge for each electroplate of $21.00 for C posters imprint and $12.50 for B poster imprint.

*Write for prices on quantities of 5,000 or more or for special rates on annual poster orders. 1 column newspaper mats on these posters are available from the National Safety Council.

PRICES SHOWN ARE SUBJECT TO A DISCOUNT OF 10% TO NATIONAL SAFETY COUNCIL MEMBERS.

FLEET POSTERS

POSTER PRICES

Posters illustrated on these pages are included in the automatic Motor Transportation poster services. Automatic poster sets are available on yearly subscription that provides (4) subjects per month viz. (2) "A" size (8½"x11½") and (2) "B" size (17"x23"). Automatic service is provided in the following categories:

City Truck Intercity Truck Sales Truck Truck Terminal	City Bus Intercity Bus Taxicab Bus Terminal	Annual price 1-4 sets, $8.85 per set; 5-49 sets, $7.45 per set; 50 or more sets, $5.95 per set.

Posters are available for individual selection at the following prices:

	1-9	10-99	100-999	1000-4999*
A size, any selection	.15	.092	.063	.052
B size, any selection	.30	.22	.185	.15

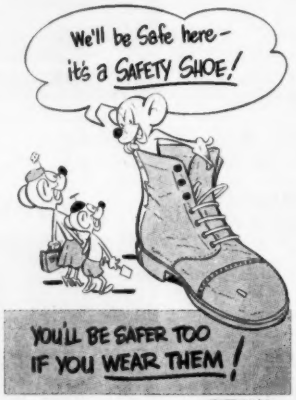
All prices shown are subject to a 10% discount to National Safety Council Members.
*Write for prices on quantities of 5,000 or more.

NATIONAL SAFETY COUNCIL

V-0629-B **17x23**

NATIONAL SAFETY COUNCIL

9695-A **8½x11½**



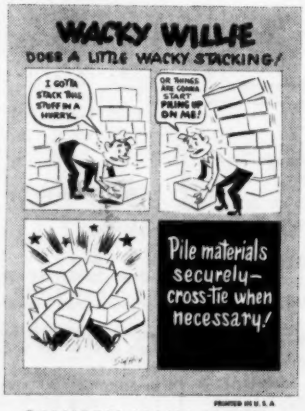
©NATIONAL SAFETY COUNCIL

0990-B **17x23**

9035-B **17x23**

NATIONAL SAFETY COUNCIL

9591-A **8½x11½**


WACKY WILLIE
DOES A LITTLE WACKY STACKING!
I GOTTA STACK THIS STUFF IN A HURRY.
OH THINGS ARE GONNA START FALLING UP ON ME!
Pile materials securely—cross-tie when necessary!

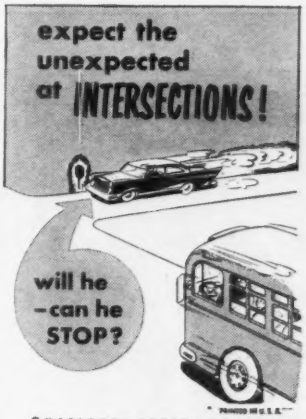
©NATIONAL SAFETY COUNCIL

0995-B **17x23**

NATIONAL SAFETY COUNCIL

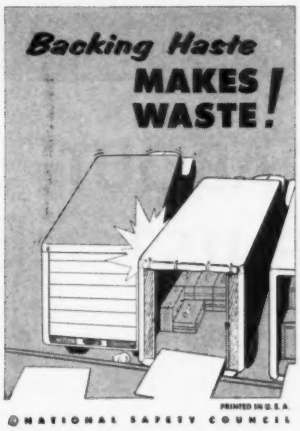
0684-B **17x23**

V-1297-A 8½x11½



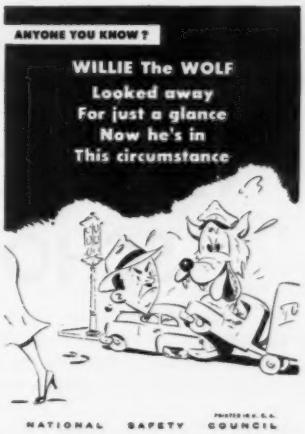
V-1295-A 8½x11½

V-1008-A 8½x11½



V-1296-A 8½x11½

V-8010-B 17x23



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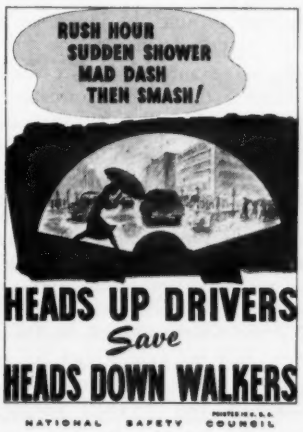
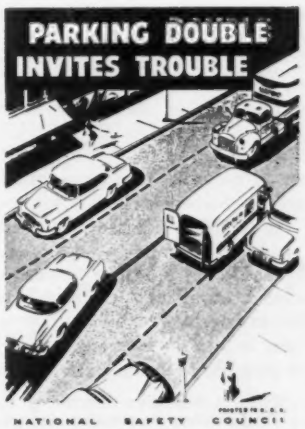


V-8692-B 17x23

V-9065-A 8½x11½



V-0406-A 8½x11½

WHAT DO WE KNOW ABOUT SCHOOL BUS ACCIDENTS?

By Hallie L. Myers

WHAT DO WE know about school bus accidents? It could be answered in two words—"Very little." We know so little about any kind of accidents that it is tragic.

The National Safety Council has little information on school bus accidents and only the composite picture of 38 reporting states. (Annual Inventory of Traffic Safety Activities.)

Someone in each state must know how many school buses are operated. Some others know how many miles they travel per day; how many pupils are carried. Someone else knows how many buses are involved in accidents each year and how many persons are killed or injured in these accidents, but seldom are all of these things assembled in one summary—and beyond this there is little information.

It is possible to get a bleak picture of school bus accident problems in Indiana from the published figures. I don't believe these figures, for I am sure we don't have all the facts. I am sure that no one in our state knows how many school bus miles are traveled each year, and I am convinced that, beyond mere totals, no one knows much about accidents involving these buses.

This is not surprising, because even with the best of reporting, our information is always colored by individual prejudices, and biased opinions. The information is always presented to put the blame on the other driver or on the child. It makes little difference to me whether the person or persons killed or injured are in the school bus or in the other vehicle. We cannot assume that the other fellow is always wrong—and even when he is, there are often extenuating circumstances.

In my experience with bus operation I have seen many buses hit in the rear by automobiles with the fault being that of the bus driver. I find it difficult, also, to consider accidents to children crossing highways to board or after alighting from a bus as being anything but school bus accidents, but they may go into the books, in some states, as pedestrian accidents instead.

As an example of two ways of presenting the little information we have, consider this statement issued by an official department: "During 1956 the public schools of Indiana operated 6,233 school buses, 200,000 miles per day, transporting some 300,000 pupils. Not a single bus passenger was lost and only one person—a 17-year old driver of a passenger car in collision with a bus—was killed. Only 77 persons were injured in 247 accidents; only 36 were school bus occupants, including 17 drivers, 12 pupil passengers and 7 adult passengers. The remaining 41 were drivers or occupants of other vehicles."

Mr. Myers is executive director of the Indiana Traffic Safety Foundation and past general chairman of the National Safety Council's Transit Section.

This statement sounds reassuring. It is a tribute to school bus drivers, school administrators and state school authorities — every one has done a good job—a good job, that is, if we don't consider the occupants of other vehicles. But we can't pass lightly over deaths and injuries merely because they did not occur on the bus.

Picture Not Rosy

Now, see how the picture is changed when we add to the above statement the following paragraph based on these same facts. "This performance record shows that accidents involving school buses are occurring in Indiana at the rate of 1.4 each school day; that their accident rate per 100 million miles of travel is 690 compared to 554 for all traffic; their injury rate is 215 compared to 193 for all traffic; their fatality rate in 1956 was 2.8 compared to 6.1 for all traffic and in 1957 will equal or exceed the state fatality rate. 1956 was the third straight year showing an increase in number of school bus accidents."

This sheds a new light on the same picture, and, I fear, not a very rosy light either. I do not vouch for the correctness of either of these statements—in fact, I think both are wrong —but if the first is correct, as we are told it is, then, the second is also correct.

The reason I am inclined to discount them is that school authorities report mileage as the total number of daily route miles, whereas buses make many special events and many drivers make two round trips to accomplish one round trip movement. Accidents on these off-route trips and on deadhead miles are included, of course, as accidents involving a school bus. Perhaps a true report of mileage would bring the rates down.

In any case, these two statements point up two conditions that should be corrected—incomplete information and some apparent tendency to "play down" the record. Our school bus safety program needs some attention. Perhaps yours does, too.

It may be that those in charge have been too close to the trees to see the forest. It may be, also, that they have received too little help from public support groups in getting needed reforms and funds.

It seems that each school corporation has such a small part of the problem that the administrator finds it easy to believe that accidents can't happen to his schools because they never have. In this he becomes much like the man who drowned in a stream that averaged only 3 inches in depth or the average Indiana motorist who, hearing that we have six fatalities per 100 million miles of travel, still knows he will not be one of them because in his lifetime he will not drive even one million miles.

With 247 school bus accidents last year in Indiana, scattered over a fleet of more than 6,000 buses, no local school authority could be much impressed with his share of the total and none could even attempt an analysis of causes. This points to the need for a very careful investigation of every school bus accident and for prompt and complete reporting of all facts to a central agency for analysis on a state-wire basis.

If I were trying to track down the causes of school bus accidents and devise ways of preventing them—in other words, if I were fleet safety director of school buses for any state—I would want much more information on each accident than is now available. I would, for instance, want to know: Did the accident involve an empty bus? Was it on a multiple lane highway? Was the bus stopped and standing at the time of the accident, and for how long had it been stopped? Did the accident occur during hours of darkness? Or on a special trip? What were weather and road conditions?

Was the stop location a factor? Age and sex of the bus driver? Other driver injured? Experience and training of bus driver. Was a substitute driving the bus? Did the accident involve no other driver? What injuries were suffered, and by whom? Did the bus meet published safety equipment requirements? Was safety equipment used? What was the passenger load at the time?

Help from Commercial Fleets

All of these questions, and more, I would want answered to provide a factual basis for attacking bus accidents. Our best existing source of information on school bus accidents may come from the records and practices of commercial bus fleets. I have found in my experience that commercial vehicle operators have made more progress in reducing traffic accidents than any other group. This probably results from the fact that for many of these operators the costs of accidents

SCHOOL BUS ACCIDENT DATA, REPORTS FROM 38 STATES FOR 1956

TYPES OF SCHOOL BUS ACCIDENTS	TOTAL NO. OF ACCIDENTS	PUPILS		OTHER SCHOOL BUS PASSENGERS		SCHOOL BUS DRIVERS		OTHERS	
		K	I	K	I	K	I	K	I
Collisions with one or more other vehicles	4760	1	820	0	32	1	74	15	486
Collisions with railroad trains	8	0	0	0	0	0	2	0	0
Other types of collisions	429	1	70	0	1	0	5	0	14
Non-collision accidents	429	3	321	0	17	0	15	1	24
Pupil struck crossing road to board or after alighting from school bus	122	25	87	0	0	0	0	0	0
TOTALS (38 states)	5801	30	1298	0	50	1	96	16	524

are greater than the total net profit of the company.

Increasing or decreasing this total represents the difference between profit and loss. They have good records of accidents and drivers. Analyzing their activities further we find that the successful ones nearly always follow a definite nine-point program of traffic accident reduction which includes:

1. A well defined set of rules and safety practices
2. Careful selection of drivers
3. Thorough training of drivers
4. Accurate records of accidents and drivers
5. Close supervision
6. Regular and thorough vehicle checks and maintenance
7. Removal of hazards
8. Incentives and awards for drivers
9. Penalties

In this batting order "penalties" are in 9th place, which is their proper position. The need for penalties comes only after all the other eight have been used.

This list contains exactly what is needed in a public safety program; however, the public inclination is to pass laws as outlined in number one, then skip over the other seven, lightly, to get to number nine—the enforcement of penalties. Experience has shown that we cannot achieve traffic safety that easily. We must bring the other seven points up to par. Let's take it point by point.

1. In many states there is a more or less concise set of rules for school bus drivers. It is doubtful, however, if many of them tell the driver what his duties are.

2. We have not even begun to do a job of driver selection. There must be some better way devised than the process of letting bus routes to the lowest bidder, as is now required by law in our state. In my opinion, there is no more reason for this than to hire teachers or janitors or superintendents on bids.

3. School bus driver training has followed closely the pattern of selection—little done. True, we have, in our state, as in some others, a requirement that each bus driver attend a safety-training meeting each year. These last about one and one-half hours. Sometimes these are held before school starts—usually after. This puts drivers in service before the safety-training session is held. In our state, these are conducted by state police officers. Without disparaging the splendid efforts of the police, may I suggest the following:

a. We used three weeks, at an estimated $300 per man to train commercial bus drivers. It seems likely that one week and $100 per man could be spent profitably for a one time course for a school bus driver. If we can invest several thousands of dollars in a bus, surely we can spend $100 to train its driver.

b. There is little in the training of a police officer that qualifies him for the specific job of operating or training some one to operate a bus. Such training is done much better by a school which specializes in training commercial bus drivers.

4. School bus accident records are not given sufficient attention. Rarely is enough information secured to permit proper analysis. A high standard of accident reporting is the principal prerequisite for the use of accident records. If the original accident reports themselves are poor, the analysis and results from them will also be poor. Since the number of such accidents is small we should be able to get each one investigated by competent persons and collect accurate and complete information on most of the points mentioned earlier.

Such information must then be care-

SOME SPECIAL PROBLEMS

School bus drivers face the added hazards of transporting the handicapped (left) and pre-school child (right).

fully analyzed and presented to each school administrator in such a way as to be of use in the hiring and supervision of drivers, the maintenance of equipment, the laying out of routes, the location of stops and in developing sound operating practices.

5. Close supervision is not practiced in many school bus fleets. It is doubtful if one school corporation in 50 has made any one person responsible for supervision of school bus operation; yet, commercial fleets find it economically sound to use riding supervisors.

6. In our state and in many others there is no requirement for periodic vehicle checks or any required maintenance schedule. School buses must be inspected once a year. Commercial fleets give a better inspection every week or 10 days.

7. Removal of hazards. Most school bus route hazards are fixed. It is often impossible to remove the hazard from the bus line, but it is seldom impossible to move the bus line from the hazard. Careful selection of stops, turn arounds, routes and schedules with hazard elimination in mind can work wonders. Here it would be well to utilize the services of a skilled bus operations man, rather than a school official. It would be better to use the two together.

8. Incentives and awards are used in few states. Indiana and Virginia, use the National Safety Council Safe Driver Award. This plan provides regular monthly mailings to bus drivers, keeping driver accident records and presentation each year of Safe Driver Awards to those qualifying. The cost of this program in Indiana is paid by an insurance company. This is the highest driver award in the land. Bonuses for accident free operation could be given also as incentives to more careful operation.

9. Whatever penalties are given —and their value is a debatable question—must follow consistent pressure on the other eight points. In fact, unless we believe that a driver deliberately has an accident it is difficult to conceive many situations where a penalty would do more than save face for the administrator. One penalty must be used occasionally. You must remove from service any driver who cannot be helped by the other eight points forcefully and faithfully applied.

Try these 14 points for —

SAFER SCHOOL BUSES

1. Provide a course of training for all school bus drivers, given by persons skilled in bus operations, preferably by a commercial bus fleet school.

2. Provide a better selection method than letting bus routes to the lowest bidder.

3. Make each contract contingent on the driver's successful completion of a pre-determined course of training.

4. Adopt and print a clear-cut set of rules and safe operating procedures that define clearly the driver's duties and responsibilities. Be sure he knows what his job is.

5. Adopt and print a clear-cut set of rules for bus passengers and distribute to parents of children using the bus. Let the parents know in advance what the rules are.

6. Make a careful selection of bus routes to get as little mileage as possible on high speed roads and as much of the loaded mileage as possible during daylight hours.

7. Select bus stops carefully to get as many as possible off the traveled way and to avoid stops just over the brow of a hill. Turn arounds should also be carefully studied to avoid hazards.

8. Have each school bus accident investigated by the county superintendent of schools and the area state police officer. See that a complete report is sent to a central state school official for record and careful analysis.

9. Require periodic vehicle checks of all buses, preferably by a commercial bus fleet garage.

10. Appoint some one person, either full or part time, as school supervisor of school bus transportation and have this person make frequent observations to see if rules are obeyed. Appoint also a state school bus supervisor.

11. Provide National Safety Council Safe Driver Award.

12. Send, from a central state agency, an annual summary and analysis of school bus accidents to every school administrator and use the results of such analysis in bus driver training schools.

13. It goes without saying that authority must be given to drivers and must be exercised by them to maintain order on board and in entering and leaving buses.

14. Finally, both school and licensing authorities must put into effect at once procedures and practices that insure physically qualified drivers.

MIAMI BUS CLEARANCE GAUGE

Top Training Aid Cuts Tire Wear and Helps Reduce Boarding and Alighting Accidents—Transit's Worst Headache

by Patrick S. Sirois

MIAMI'S top transit headache has been a three-sided one—passenger accidents—the bane of the transit industry; excessive tire wear, caused by the rubbing of tires against loading zone curbs, and integration of the newly-employed operator.

We licked the headaches one by one. But the most helpful solution to our problem came with the introduction of the bus clearance gauge—a device to aid operators in judging the distance of wheels to curb. With the gauge, even the veriest tyro moved his bus to within a foot of curb or stop with a minimum amount of training.

To understand our problem, perhaps a bit of history is needed:

A few years ago, before standardization of equipment, we found that springs broke or sagged and had to be re-arched. By measurement, we found the front and rear steps, after spring changes, to be 2½ to 4 inches higher than standard. We contacted the spring service which re-arched our springs and requested that springs be re-arched to our specifications. There was a noticeable decrease in boarding and alighting accidents immediately thereafter.

In specifying new equipment, we asked for the lowest step setting available. Short people have difficulty in boarding buses, most especially where curbs are rare. Dirt and gravel stops become hazardous as the weight of buses tamp down the terrain leaving pot holes and depressions which become breeding grounds for claims and broken ankles.

These zones create other problems as well. Operators do not develop the fine judgment of space relationships to curbs where they rarely have curbs to pull into. Where zones with curbs are available, proper positioning of buses, with front and rear doors parallel and within 12 inches of the curb, is mandatory. Forcing passengers to take the "long step" when buses are positioned 18 to 24 inches out from the curb will trigger boarding and alighting accidents. The driver, then, is faced with two possibilities: that of positioning his bus parallel and within 12 inches of the curb, or, staying out far enough from the curb to force passengers to step up or down on the hard pavement and then to the curb.

In areas where zones are obstructed by vehicles, we instruct operators to park parallel with offending vehicles so that boarding and alighting may be accomplished safely. Angling into a zone with the front door to the curb and the rear doors out from the curb generally encourages accidents to the rear of the bus, impedes the even

The author is director of safety for the Miami Transit Company and the Miami Beach Railway Company. More information on the construction and use of the bus clearance gauge can be had from Mr. Sirois. You may write him c/o the Miami Transit Company, 204 Roper Bldg., Miami 32, Fla.

OSTRICH STOP—NOSE IN, TAIL OUT

Stop made without gauge shows rear wheel a foot from curb, front wheels 6½ inches from curb.

THIS IS THE GAUGE

Dotted line shows clearance gauge. Operator lines up sight with bolt head and top edge of curb.

flow of traffic we need, and encourages complaints from the police and motorists.

In areas where no curbs are available, we are instructing operators to stop on the hard pavement as far to the right edge of the pavement as possible with sufficient space to have the alighting passenger take the first step on solid, even pavement. In Miami, we have better than 80 per cent of dirt and gravel stops.

Tire Wear

Like other training departments, we emphasize the advantages of proper curbing and demonstrate proper techniques of pulling into and out of zones safely. We couple this with educational material on the causes and costs of passenger accidents.

Many operators have a tendency to pull in too closely to curbs, rubbing the right rear tire on the curb. This does not happen with all operators, but with the occasional operator who has not developed the fine judgment required, it takes only one or two rubs a day and over a very short period of time tire wear, bruises, cuts, etc., destroy tires before the life of the tire can be enjoyed. Even with tire contracts, this can be expensive. Campaigns with regular operators and careful attention to newly-hired operators have been effective. In spite of all of these measures, the problem has not as yet been solved completely.

The idea and first model of a clearance gauge originated with C. A. Nicodemus, Supervisor and ex-instructor for the Miami Transit Company. He proposed that gauges could be developed for buses so that all stops might be made uniformly. We threw the idea around in the training school and used the first model with a class of students. We brought the supervisors in on the idea. All were enthusiastic, but raised basic objections to anything which might distract the operator pulling into heavy loading zones, or diverting his attention ahead. Some stated that they were unable to sight properly with the original model. By experimenting with the original model, made with readily available materials, we improved on the gauge and found new uses for it.

In addition to helping operators curb uniformly, it acts well as a clearance gauge in heavy traffic and on de-

To Page 56

PROPER STOP, USING GAUGE

Instructor uses gauge and positions bus with both wheels approximately 6 inches from the curb.

WHEEL RUB CAUSES TIRE WEAR

Stop made by experienced operator is up against curb, good for passengers but bad for tire life.

CLIMATE GOOD FOR FALLS

Passengers alighting from rear door are forced to take long step which may result in falls and injury.

DIRT AND GRAVEL STOPS—SPECIAL HAZARD

Using gauge, set wide, bus is positioned so boarding and alighting passengers have even surface for use.

THE SAFETY LIBRARY

By Ruth Parks, Librarian, NSC

Books, pamphlets, and articles of interest to safety men.

Automobiles

Automobile Facts and Figures. 80p., 1957 edition. Automobile Manufacturers Association, New Center Building, Detroit 2, Michigan.

Child Safety

Don't Let Your Children Make a Playground of the Family Car—It's Dangerous. *California Highway Patrolman.* p. 47+, December, 1957.

(Good behavior for children in car.)

Commercial Vehicles

Safety Program Cuts Accidents in ½ for Hess Cartage. *Commercial Car Journal,* p. 78-79+, December, 1957.

(Through use of the Smith System of training drivers in better seeing habits.)

Conferences

Conference Drafts Basis for Drastic Accident Cut. *Review and Outlook,* p. 1+, December 18, 1957.

(Public Officials Traffic Safety Conference sponsored by the President's Committee for Traffic Safety. Top priorities and public support program outlined.)

Summary of Immediate Needs Adopted by Conference. *Review and Outlook,* p. 2, December 18, 1957.

(Public Officials Traffic Safety Conference sponsored by President's Committee for Traffic Safety.)

Controlled Access

How Access Control Affects Accident Experience. Charles W. Prisk. *Public Roads,* p. 266-267, December, 1957.

Courts

Sentence: Safety Minutes, p. 26-28, December, 1957.

(Baltimore's teen-age traffic court.)

Drivers and Driving

Traffic Laws and the Driver. Edward R. Curtis. *MSU Center Line,* p. 3, December, 1957.

(Many accident drivers are violating the traffic laws.)

Driver Licensing

Code Changes Affect the Teen-Age Driver. *California Highway Patrolman.* p. 59-60+, December, 1957.

(California vehicle code changes.)

Electronics

Iowa Research Studies Go Electronic. J. J. Heatley. *Traffic Engineering,* p. 18-19+, December, 1957.

Headlights

Aim Dual Headlights with Care. *Commercial Car Journal,* p. 66-67+, December, 1957.

(Use of four lamp headlights in cars and trucks.)

Hedges

Crash-Barrier Tests on Multiflora Rose Hedges. Russell R. Skelton. *Public Roads,* p. 245-252+, December, 1957.

(Reduces crash-impact and as median plantings eliminate headlight glare.)

Highways

Problems of Service Facilities on Planned-Access Highways. 10p., 1957. National Highway Users Conference, 966 National Press Building, Washington 4, D. C.

Insurance

The First Thirty Years. 53p., 1957. Casualty Insurance Companies Serving Massachusetts, 8 Beacon Street, Boston 8, Massachusetts.

(A commentary on the operation of the Massachusetts Compulsory Automobile Liability Insurance Act.)

Lighting

The Road Surface and the Lighting Engineer. A. W. Christie. *Journal of the Institution of Municipal Engineers.* p. 153-160, November 5, 1957.

(Report of measurements made by Road Research Laboratory, England, on both wet and dry surfaces.)

Visibility on the Road. A. J. Harris. *Transactions.* 1957, vol. 22, No. 9, p. 243-260. Illuminating Engineering Society, 32 Victoria St., London, S.W.1., England.

(Methods for defining and measuring visibility and analysis of the idea of visibility.)

Will Our Super Highways Be Blacked Out. Herbert A. Friede. *Municipal Signal Engineer,* p. 32-35, November-December, 1957.

(Importance of vision and lighting in driving.)

Night Driving

Night Visibility, 1957. Bulletin 163. 32 p. 80c. Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

(Four papers—Assessment of nighttime roadway visibility, D. M. Finch and J. D. Palmer; Some night views of a highway lighting test installation, George A. Nagel; A device for establishing a safe stopping distance at night, Clifford O. Swanson; Visibility of reflectorized license plates, Earl M. Larimer.)

Parking

Atlanta Solves Its Downtown Parking Problem. Karl A. Bevins and Earl R. Slider. *Traffic Engineering,* p. 13-17, December, 1957.

Pedestrians

The Pedestrian Problem. Progress Report on a Continuing Challenge. 99p., 1957. American Automobile Association, 1712 G Street, N.W., Washington 6, D. C.

(Statistical summary and report of each state comparing the years 1940 through 1956 showing the decrease in pedestrian accidents. In chart form.)

Point Systems

Report on 'Point System' Study. *AAMVA Bulletin.* p. 1-2, November, 1957.

(Progress report of a two year study being conducted at Institute of Government, University of North Carolina, 1958 to be devoted to analysis of data and final report.)

Ramps

Operational Characteristics of High Volume On Ramps. Eugene J. Lessieu. *Traffic Engineering,* p. 9-12+, December, 1957.

(Comparison of merging traffic on one-lane and two-lane ramp access.)

Research

Intensive Investigation of Accidents Planned to Discover True Causes.

Traffic Engineering, p. 24-25, December, 1957.

School Buses

Michigan School Bus Accidents. *Mass Transportation* (School Bus Trends), p. 48-49, December, 1957.

School Bus Accidents. How Much Do We Know About Them? How Can We Learn More About Them? Hallie L. Myers. *Mass Transportation* (School Bus Trends), p. 44-46, December, 1957.

School Bus Safety in the Courts. Harry N. Rosenfield. *Mass Transportation* (School Bus Trends), p. 39-40, December, 1957.

(Principles of liability and condition they revolve about.)

Urban Area Safety Problems. Robert G. Hayes. *Mass Transportation* (School Bus Trends), p. 41-42, December, 1957.

Signs and Signals

Signing Program for County Roads. *Better Roads*, p. 29-30+, December, 1957.

Skidding

Use of Skidmarks in Traffic Cases. Part 2. Robert L. Donigan. *Traffic Digest and Review*, p. 9-22, December, 1957.

Speed

Theory of Speed Zones in Developed Areas. John E. Baerwald. *Traffic Engineering*, p. 20-23+, December, 1957.

Speed

Do You Drive at—Super Visual Speeds? *California Highway Patrolman*, p. 35, December, 1957.

(Decrease of vision with increase of speed.)

Traffic

Traffic and Travel Trends, 1956. Thomas B. Dimmick. *Public Roads*, p. 253-255, December, 1957.

(Passenger cars, trucks and buses.)

Transit Industry

Here's a Winning Safety Program that Hits the Mark. *Fleet Owner*, p. 38-40, December, 1957.

(Fleet and community program at British Columbia Electric Company.)

Winter

Snow Fences of all Kinds, Sizes and Shapes. John Sherrod. *Better Roads*, p. 40, December, 1957.

Forecasts of Death

IN THE DEBATE between Gov. Leader and Executive Manager Harry H. Brainerd of the Western Pennsylvania Safety Council as to the wisdom of estimating how many accidental deaths will occur during the holidays, Mr. Brainerd seems to have the better argument.

Mr. Leader opposes publication of estimates as to the probable number of fatalities. He thinks safety would be better promoted by "alerting drivers not to break up anyone's family circle during the holidays."

Well, The Sun-Telegraph and other newspapers do that, too, but it is our opinion that the appeal for safe driving receives emphasis which it could not gain in any other way by frankly facing what is liable to happen.

●

THE ESTIMATES OF traffic fatalities are based on the experience of other years. They do not exaggerate the danger; on the contrary they often fall below the figures that actually materialize.

One knows of no more forceful way of calling attention to the perils of careless driving than to compute on the basis of what happened in former years just what is liable to happen this year.

It impresses on every driver reading the forecast the possibility that he might be among the fatalities, and chances are he will keep the danger more vividly in mind on that account than he would if the estimates were suppressed.

●

GOV. LEADER SAYS estimates of holiday death tolls have proved ineffective in curbing highway deaths.

How does he know that?

It might be that the number of fatalities would be much greater if, as he requests, the advance estimates should not be issued.

If the solemn warning contained in these fatality forecasts should save a single life, their issuance would be amply justified.

We can't see what harm they do.

Would Gov. Leader favor sweeping the dust under the bed to create a false impression that the room is tidy?

Reprinted courtesy of the Pittsburgh *Sun-Telegraph*

Addresses of Magazines Mentioned

AAMVA Bulletin, American Association of Motor Vehicle Administrators, 912 Barr Bldg., Washington 6, D. C.

Better Roads, A. Perrin Publisher, 173 W. Madison St., Chicago 3, Ill.

California Highway Patrolman, California Association of Highway Patrolmen, 1213 H Street, Sacramento, Calif.

Commercial Car Journal, Chilton Co., Chestnut and 56th Sts., Philadelphia, Pa.

Fleet Owner, McGraw-Hill Publishing Co., 330 W. 42nd St., New York 36, N. Y.

Mass Transportation, Hitchcock Publishing Co., Wheaton, Ill.

Minutes, Nationwide Mutual Insurance Co., 246 N. High St., Columbus 16, Ohio.

MSU Center Line, Michigan State University, East Lansing, Mich.

Public Roads, Bureau of Public Roads, Washington, D. C.

Review and Outlook, Automotive Safety Foundation, 200 Ring Bldg., Washington 6, D. C.

Traffic Digest & Review, Traffic Institute, Northwestern University, 1804 Hinman Ave., Evanston, Ill.

Traffic Engineering, Institute of Traffic Engineers, 2029 K St., N. W., Washington 6, D. C.

Miami's Bus Clearance Gauge

From Page 53

tours. It also enables operators to curb parallel after a tight right hand turn. It has the effect of arousing the curiosity of old operators.

At present, we are using this gauge only in the training and retraining of operators. The results to date are promising and we may install these on all of our buses after we have made sufficient studies on results achieved.

We feel that further refinements will be made as we continue to use this gauge in training. To date we have trained about 40 operators with this gauge. Experienced operators found it helpful. Inexperienced operators were able to curb buses properly, within 12 inches of the curb, front and rear doors parallel, without rubbing curbs.

Position On the Bus

This gauge is positioned on the dash with the right end to the center of the left and right windshields. The left end is positioned at the base of the left windshield, about ½" from the glass, inside the bus. To put it another way, the gauge is fastened to the extreme right of the left windshield on the dash. The right edge of the gauge is positioned to the center of both windshields.

Once the gauge has been secured, the bolt and sight is moved manually to the extreme right. To establish the position in which the gauge can be used, the operator must make what he considers a good curb stop, using only his ability to judge distance. If the front wheels of his bus are within 12" of the curb, he can adjust the sights with the top edge of the curb.

Using the gauge, his next stop will be within ½ to 1 inch of the position he has set for himself, with his rear parallel with the front. If he has missed sighting with the gauge and is too close, he moves his sights to the right, if he is wide of the curb, he moves his sights, ½ inch at a time, to the left. Usually only one adjustment is necessary. He can then drive all day and curb uniformly by using the gauge.

Sighting must be done with both eyes. The operator lines up the sight with the bolt end and both must line up with the top of the curb. Most men need very little practice.

Each operator must adjust the sight according to his height and position in the driver's seat. If the gauge is moved, he must readjust it to his position. The gauge has an effect on operators who start out sitting erect and who have a tendency to slouch after driving awhile. When using the gauge the operator is brought back to an erect, comfortable position. I believe that this may also make operators who use this gauge more alert in pulling into heavy loading points. Care in training will overcome the objection that an operator may be distracted, or may concentrate too strongly on the gauge to the risk of pedestrians or vehicles. We have not found this to be so.

To determine the effectiveness of the gauge, proper positioning on the bus, and other facts necessary for training, we took an instructor who is a very skillful operator and had him make series of stops where curbs were available, with and without the gauge. While he did not rub rear wheels on the curb, he came very close several times. We found that he had a tendency to come in closer to the curb on each stop he made. At times he was within 8 inches of the curb with the front wheel, at other times, he was right on the curb with the right rear wheel, barely missing the rubbing we are hoping to eliminate.

We then installed the gauge, had him adjust the sights to his vision and asked him to curb his bus using only his ability to judge distance. He placed his front wheel 10 inches from the curb. The rear wheel angled out about 4 inches. He then adjusted his sight for that position. On a series of stops using the gauge, he varied no more than 1½ inches in toward the curb, but the rear wheels were parallel with the front ones and on the last several tries, he was "on the nose" each time.

Conclusion

We feel that this gauge has merit. We have had only one incident of a student rubbing the curb, and he admitted that he was not using the gauge. It may not be necessary to install the gauge on all buses since with continued use the student finds the spot on the windshield, associates it with a set screw or marks the rubber beading around the windshield, which is adequate for his position and vision. Some students have masking tape or strips of gummed paper which they use to identify the "spot" and sight by using the top edge of the paper to the top of the curb.

To date it has been an effective training tool. It makes operators clearance-conscious, curb-conscious and less sure of abilities they have always ascribed to themselves. It is like showing a man how many feet it will take for stopping at a certain speed. It is something he can see for himself and elicits voluntary action.

How Railroads Back the Attack

From Page 33

and home and off-the-job safety generally," Williams said. "However, it wasn't long until the community safety organizations and city, county and state officials were calling upon them to assist in safety programs on a city, county and sometimes statewide basis. These organizations, I feel, are doing an excellent job for traffic safety in the great southwest."

The Atchison, Topeka and Santa Fe's Safety Department is doing a good job in promoting safety and in rendering assistance to public, civic and social organizations endeavoring to promote traffic and other off-the-job safety projects.

Department personnel includes Superintendent E. L. Duggan, two assistants, fourteen safety supervisors and three clerical workers. Duggan and his clerical staff headquarter in Chicago, and his assistants in Los Angeles and Topeka. Supervisors are stationed at advantageous points along the system.

During 1956—a typical year—the Santa Fe conducted 65,835 meetings for employees and their families; 650 with school children, teachers and PTA groups; and 350 with civic, business or professional groups. This is a total of 69,850 safety meetings. The audience was over a million persons.

Because the safety program conducted by the Frisco railroad has been so outstandingly successful, Roy P. Hamilton, its director, has been asked by many industries served by the railroad, and by other railroads, to help

them establish similar programs. Frisco provided the assistance and know-how to enable these to become self sustaining. They are now generating needed public support for traffic safety in communities in which they were formed.

Most of the railroads use traveling safety cars to help teach safety. Two New York Central safety cars—rolling theaters for showing safety films and for safety demonstrations and lectures—cover seven states each year. D. E. Mumford, director of safety for the company, reports there were 731 showings of off-the-job safety films to 11,587 employees during a typical year, and 13 showings to school children, service groups, public officials and representatives of other industries.

J. T. Andrew, safety supervisor for the Great Northern, reports that their employees work locally in towns and cities served by the railroad to promote better compliance with the Signs of Life, particularly those protecting railroad crossings. Employees also report violations at crossings when they are observed.

Equally impressive is the safety program of the Reading Railroad directed by Superintendent of Safety C. K. Hoch. More than 3,000 persons attend the president's annual Safety Rally.

The Safety Department of the Southern Pacific, directed by M. A. Nugent, is also doing a very good job. They recently completed an excellent color movie in cooperation with the California Highway Patrol which tells the Signs of Life story. It is dramatic, educational and highly interesting to audiences of almost all ages.

These are only a few of the activities being carried out by the nation's railroads. Many railroads not mentioned here because of space limitations are conducting programs which are equally impressive. We owe them a vote of thanks for their good work.

Simmons Joins NSC Field Staff

A former local safety council manager, George T. Simmons, of Montgomery, Ala., has been appointed district field director in the National Safety Council's field service department. He joined the Council staff in January.

His duties will be to stimulate and assist the safety programs of Alabama, Mississippi and Louisiana. His headquarters will be in Montgomery.

Simmons' appointment, according to Paul Hill, manager of the field service department, is the result of an expansion of the Council's activity in the formation and service of state and local safety councils.

Appointment of Simmons, a U. S. Marine for four years during World War II, brings to eight the number of new district field directors hired since the Council began its expansion program.

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Emblems
Raincoats
Capes
Caution Flags
Merit Awards
Boots & Overshoes
Corporal Digbys
Trafficones
School Warning Signs
Traffic Control Signs

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Circle Item No. 5—Reader Service Card

MOTOR-VEHICLE DEATHS AND INJURIES BY STATES — 1957 AND 1956

Twenty-three states reported more injuries during the first ten months of 1957 than for the same period last year. Eleven states and the District of Columbia recorded fewer injuries.

For ten months or less 47 states and the District of Columbia reported. Thirty-two states tallied more injuries. Fifteen states and the District of Columbia counted fewer injuries.

For the entire reporting period, 17 states and the District of Columbia reported more traffic deaths, 29 states recorded fewer, and one state reported no change from last year.

MOTOR-VEHICLE DEATHS AND INJURIES BY STATES 1957 and 1956

	Months Reported	Deaths†† 1957	Deaths†† 1956	Injuries†† 1957	Injuries†† 1956	% Changes 1956 to 1957 Deaths	% Changes 1956 to 1957 Injuries	1957 Ratio of Injuries to Deaths
TOTAL U. S....	**	27,854	28,856	1,029,159	981,388	— 3	+ 5	37
Ala.	10	750	793	4,168†	4,756†	— 5	— 12	6
Ariz.	9	319	319	5,772	5,336	0	+ 8	18
Ark.	10	395	391	2,462	2,525	+ 1	— 2	6
Calif.	10	2,960	3,021	110,870	107,867	— 2	+ 3	37
Colo.	10	303	354	9,135	8,950	— 14	+ 2	30
Conn.	10	224	242	16,823	15,081	— 7	+ 12	75
Del.	10	75	72	2,161	2,157	+ 4	+ *	29
D. of C.	10	52	44	5,776	6,081	+ 18	— 5	111
Fla.	10	839	983	26,596	24,960	— 15	+ 7	32
Ga.	10	765	907	6,973	8,757	— 16	— 20	9
Idaho	9	144	195	1,900	2,066	— 26	— 8	13
Ill.	10	1,694	1,722	74,481	70,914	— 2	+ 5	44
Ind.	10	947	970	31,802	31,425	— 2	+ 1	34
Iowa	9	511	513	15,821	15,178	— *	+ 4	31
Kans.	10	449	550	9,009	8,953	— 18	+ 1	20
Ky.	10	647	604	11,372	10,551	+ 7	+ 8	18
La.	2	112	117	1,186	1,224	— 4	— 3	11
Me.	10	112	132	4,845	2,453	— 15	+ 98	43
Md.	10	467	443	15,505	16,288	+ 5	— 5	33
Mass.	6	207	254	42,281	42,510	— 19	— 1	204
Mich.	10	1,202	1,401	47,540	48,705	— 14	— 2	40
Minn. ..	10	556	518	19,684	18,913	+ 7	+ 4	35
Miss.	10	403	430	5,243	5,352	— 6	— 2	13
Mo.	10	789	889	9,893	9,709	— 11	+ 2	13
Mont. ..	10	161	217	2,203	2,447	— 26	— 10	14
Neb.	10	242	251	7,925	7,616	— 4	+ 4	33
Nev.	2	15	14	266	237	+ 7	+ 12	18
N. H.	10	80	84	4,729	4,667	— 5	+ 1	59
N. J.	8	546	479	37,425	36,103	+ 14	+ 4	69
N. M. ..	10	357	317	3,936	3,377	+ 13	+ 17	11
N. Y. ..	9	1,512	1,499	187,648	160,309	+ 1	+ 17	124
N. C.	10	871	886	15,489	15,561	— 2	— *	18
N. D. ..	5	30	40	775	683	— 25	+ 13	26
Ohio	10	1,639	1,576	65,341	63,930	+ 4	+ 2	40
Okla.	10	579	555	11,340	10,883	+ 4	+ 4	20
Ore.	10	355	338	12,973	14,142	+ 5	— 8	37
Pa.	10	1,349	1,436	67,725	69,191	— 6	— 2	50
R. I.	2	9	6	1,190	1,120	+ 50	+ 6	132
S. C.	10	593	578	8,942	9,599	+ 3	— 7	15
S. D.	10	143	156	2,573	2,297	— 8	+ 12	18
Tenn.	10	559	610	10,764	9,156	— 8	+ 18	19
Texas	10	2,050	2,079	51,085	47,957	— 2	+ 7	25
Utah	8	132	137	3,300	3,123	— 4	+ 6	25
Vt.	10	89	81	2,382	2,202	+ 10	+ 8	27
Va.....								
Wash. ..	10	428	422	20,813	18,380	+ 1	+ 13	49
W. Va. ..	9	350	313	5,675	5,859	+ 12	— 3	16
Wis.	10	744	788	21,711	20,119	— 6	+ 8	29
Wyo.	9	119	130	1,651	1,619	— 8	+ 2	14

†Rural injuries only.

††All figures are preliminary. To insure proper comparisons, 1956 figures cover the same reporting period as those for 1957.

*Less than .5%.

**Death and injury totals cover reports for all months indicated in this column.

A.M.A. Pamphlet Lists Driver Fitness Rules

Some of the things that can make a driver dangerous are listed in a new American Medical Association pamphlet, "Are You Fit To Drive?"

The pamphlet, to be distributed through physicians' offices, was prepared by the A.M.A. Committee on Medical Aspects of Automobile Injuries and Deaths, in cooperation with the Center for Safety Education, New York University.

Some of the things that make a driver dangerous are:

- Emotional upsets. Unless a person can keep his mind on the wheel and not on his worries, he should not take the wheel.
- The driver's attitude. Some drivers feel the other fellow is always wrong. Some are aggressive and intolerant when they get into a car. They need to be mature.
- Sleepiness. A sleepy driver is as much a hazard as a drinking one. Dozing is not restricted to night driving. When making long trips, a person should rest every two hours, drinking coffee or cola to stay alert. He should not take any medicine that makes him drowsy.
- Medicines. Antihistamines, cold tablets, sedatives, tranquilizers, and some other drugs may dull reflexes or impair coordination. Stimulants may make a person nervous. The doctor should be consulted about the side effects of any drugs.
- Faulty vision. A driver needs regular eye examinations; if he notices any change in his eyes between examinations, he should see his eye doctor immediately. To reduce eye strain he should wear properly fitted sunglasses, but not after dark. To avoid tiring the eyes, excessive night driving should be avoided if possible. Hay fever or the common cold can blur the vision dangerously.
- Certain nerve and heart disorders. Some may cause convulsions and others may result in occasional loss of consciousness. The doctor is the best judge of whether a patient with these disorders should drive.
- Diabetes. Insulin reactions may cause difficulties, but diabetic patients who follow their doctor's advice can be safe drivers.
- Old age. After 65, reflexes and coordination tend to be a little slower, people tire more easily, resistance to glare is lessened, and the ability to see at night is declining. Older drivers should schedule their trips at non-rush hours and should not spend long periods at the wheel.
- And, of course, drinking.

A New Film For Driver Education

The University of California at Los Angeles has released a new 16mm, 12 minute—black and white motion picture, *"Impact."*

The film is 16mm, 12 minutes, black and white, sound, sales price: $55.00, rental: $2.50. For further information please write to: Educational Film Sales Dept., University Extension, University of California, Los Angeles 24, Calif.

New Film Ordering Procedure Now in Effect

On January 1, 1958, the National Safety Council turned over its film rental libraries to Association Films, Inc., which now handles bookings, shipments, and billings direct with customers. Users now are asked to address and send orders for rental prints to Association Films, not to the Council.

The company has four distributing offices:

1. Broad at Elm, Ridgefield, N. J.
2. 561 Hillgrove Ave., La Grange, Ill.
3. 799 Stevenson, San Francisco.
4. 108 Jackson, Dallas, Tex.

To speed bookings, send requests to the nearest office.

Prints may be ordered by TWX teletype. The numbers of the branch offices are:

New York	N Y 1-4649
Dallas	DL 1095
La Grange (Ill.)	LAG 2651
San Francisco	S F 1572

Requests to the Ridgefield office should be made to the New York number.

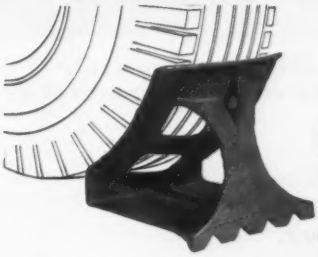
CORRECTION

On page 58 of the February, 1958, TRAFFIC SAFETY, we printed a statement that individual prints of The Defensive Driving Series would be available for rental through Association Films, Inc., after January 1, 1958.

The prints are *for purchase only. There will be no rentals.*

Circle Item No. 6—Reader Service Card

ANCHOR your Truck Fleet!



CASTEEL

HEAVY DUTY WB 15 Wheel Blocks

. . . hold SAFELY on any surface

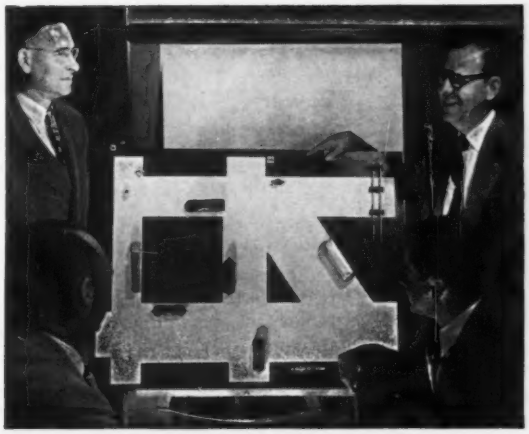
The wide face area accommodates large tires. The broad flat base gives stability in soft terrain. Five ¾" angular calks, cast in rear of base, hold securely on ice, snow or concrete.

Sturdy brace supports are provided with a cast-in hole for chain or hook connection.

For other sizes and types of Safety Wheel Blocks, send for our Bulletin No. C-58.

CALUMET STEEL CASTINGS CORP.

1636 SUMMER STREET HAMMOND, INDIANA



THE "EYES" HAVE IT . . . .

Here is an aid that has proven practical in teaching visually the principles of safety. It's simple, effective and works wonders in teaching your drivers.
The MAGNO SAF-T BOARD is the result of studies by outstanding safety instructors and engineers. Safety directors, traffic managers, driving instructors, insurance agents and adjusters get a clear picture of how accidents occurred visually by reconstruction of conditions.
It is now being used from coast to coast by fleet owners, insurance and public utility companies, colleges and schools, and many other concerns interested in public safety. Consisting of a BOARD with typical street intersections on one side. The other side is a BLACKBOARD on which any street or road situation can be drawn with chalk and then erased. It has scale models of vehicles, traffic markers and accessories that can be placed in any conceivable traffic situation.

Write for our folder. It contains full information.

MAGNO SAF-T BOARD © **EMIGSVILLE, PA.**

Circle Item No. 7—Reader Service Card

NEW... SAFETY EQUIPMENT

Publication of product announcements in this section should not be construed as endorsement or approval by the National Safety Council.

Windshield Wiper Arm

This new arm introduces for automobiles the wide-range "Spring Toggle" pressure adjustment originally designed for jet aircraft.

The "Anti Wind-Lift Arm" effectively combats wind lift, skip-wipe and snow pack. With a simple screwdriver adjustment, the arm pressure can be custom-set to keep the blade hugging the glass even at superhighway speeds. It not only provides a clean wipe, but also makes blades last longer before starting to streak.

According to the recommendations of safety and automotive engineers, a wiper arm should exert one ounce of pressure per inch of wiper blade length for a good, clean wiping job under all weather conditions.

The new "Arm" comes in two universal models to "quick-fit" all drum head (Model DH-illustrated) and screw head (Model SH) wiper shafts beginning on 1941 cars. The arms are fully extensible from 10 to 14 inches and replace all left-hand and right-hand arms.

The Anderson Co., 1075 Grant St., Gary 40, Ind. (Item 41)

Power Speaker

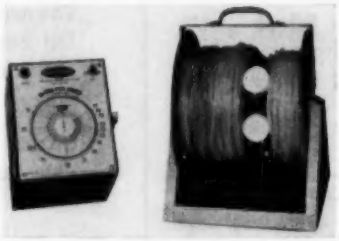
A new transistorized "Big Voice" power speaker increases the effectiveness of two-way mobile radios by extending the listening range hundreds to thousands of feet.

By turning a simple control, the speaker is converted into a powerful public address system with a half-mile or more range.

The outside mounted speaker, along with its mounted-control unit, provides three types of operation to a vehicle equipped with any motorola two-way radio. The radio may be used normally, receiving through its regular dashboard speaker; then, if the driver must leave the vehicle, receiver output can also be switched to the "Big Voice" speaker enabling the driver to hear incoming messages; or thirdly, the speaker with the radio-microphone can be used as a public address system with the dashboard speaker remaining connected to the receiver to keep the radio in operation.

The speaker is rugged and weatherproof and made of solid cast aluminum. Its double re-entrant form produces true voice reproduction at full power. A swivel-mount for directional control is an optional accessory.

Motorola, Inc., Communications and Industrial Electronics Div., 4501 W. Augusta Blvd., Chicago 51, Ill. (Item 42)



Speed-O-Meter

The Kemco Speed-O-Meter can be used by municipalities and state police for effectively controlling speed and traffic. Exclusive features of the unit are: Miniature road tubes manufactured of all-weather clear plastic; indestructible road switches with no moving parts that operate in any position; integral electrical cable, switches and road tubes; no electrical switch connectors to break or short-cut; and a compact, lightweight reel that weighs only 40 lbs. complete with electrical cable, switches, road tubes and two blades.

The unit automatically records the speed of a vehicle traveling through a fixed distance. At distances of 250′ to 500′ a stopwatch records the speed of the vehicle indicated on the dial both in time and in MPH. The unit is very accurate and simple and easy to operate.

W. B. Kidder Engineering and Manufacturing Co., 2140 Waite Ave., Kalamazoo, Mich. (Item 43)

Safety Brake Valve

The function of the Safeguard Valve is to provide a vehicle with uninterrupted braking power after a rupture occurs in the hoseline or diaphragm. When such an emergency occurs, a neoprene tip stainless steel plunger automatically moves to seal off the defective line. It does not apply the brakes—rather, in preventing the air or fluid from escaping through the defective line, it isolates the brake failure to a single wheel, thereby retaining full braking power on all remaining wheels. One valve for each axle is required on all brake systems. The hydraulic valve (#200H) isolates the brake failure to a single axle and only one valve is required for each vehicle.

The economical unit is light weight, self-cleansing and requires no maintenance cost. It can be installed on trucks, trailers, buses and passenger cars quickly and easily.

Safeguard Brake Valve Co., 1414 S. Atlantic Blvd., Los Angeles 22, Calif. (Item 44)

For More Information—Circle Item on the Reader Service Postcard

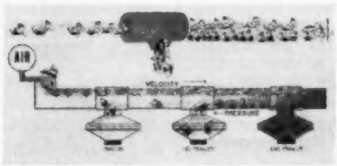
Speed Detector and Camera

This electronic digital speed detector and camera is designed for wholly automatic operation in producing a photographic, error-free, record of speeding offenses, with a new standard of precision in speed measurement and with a legally type standard of performance. That standard admits of occasional speeder escaping detection, but positively will not photograph a non-speeder as a speeder under any circumstances. The equipment has a recycling rate of three-quarter second and on the basis of surveys may be expected to produce virtually 100 per cent enforcement of speed limits.

Although designed for automatic operation, it may be used with the issuance of summonses by attending officers at the time and location of the violation on the basis of observed operation of the camera and its strobe light when a speeder passes the speed measurement zone. In such application, the only manpower required is to issue summonses, since the apparatus automatically produces the complete evidence of the offense.

The detector may be set to operate automatically for all vehicles above any desired speed setting. It controls the camera to photograph either the front or rear of vehicles. The camera requires no adjustment for distance to the subject or for varying daylight. The 35mm magazine has 1200 exposures and the data chamber records speed, time and date.

Foto Patrol, Inc., 11 E. Forty-eighth St., New York 17, N. Y. (Item 45)



Airbrake Safety System

A safety system that is said to virtually eliminate truck and trailer jack-knifing due to unequal airbrake application uses a venturi principle whereby the system applies multiple axle brakes in sequence quickly and smoothly, starting with the axle farthest from the tractor, thus keeping the trailing vehicles lined up and bringing the entire unit to a quick, safe stop.

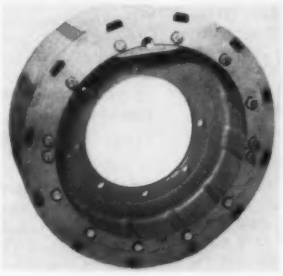
The unit is especially desirable for winter months when adverse driving conditions make smooth stops a more important safety factor.

The valve and tee combinations utilize service line air-pressure to apply the brakes and train reaction. When semi or dual trailers are being pulled, the trailer brakes will apply first and so on down in sequence to the truck brakes, and the brakes release in exactly opposite sequence, starting with the truck brakes.

The system operates correctly, regardless of the speed of application of the brakes. Brake application pressure is the same on all vehicles and the application of the back axle is always fast, regardless of whether the truck is traveling solo or in train.

The system is practical because alternating or switching of the trailers to various combinations does not change the correct performance of the system. The over-all stopping distance, even with the monetary slowing down of the tractor brakes, is not appreciably changed.

Power Brake Equipment Co., 1632 S. E. Eleventh Ave., Portland, Ore. (Item 46)



Heavy Duty Brake

This heavy duty full circle brake for off-the-road equipment is called the "Hi-Torque." It is the first hydraulic drum-type brake with 360° expanded tube actuation designed exclusively for large tractors, scrapers and earth movers.

The brake operates with nearly constant lining pressures at all points around the drum area, at only one-half the usual maximum lining pressure encountered with anchored shoebrakes. The new brake gives operators greater safety and control while operating at faster speeds. Brake fade is reduced by lower, uniform lining pressure on the drum and non-self energizing design.

The "Hi-Torque" is said to be unusually simple and easy to service. It requires no lubrication, eliminates mechanical shaft or cam alignment problems and can be disassembled with only standard hand-tools.

Made in most popular sizes, the brake is bolted as a single unit to the axle or axle housing of the vehicle and uses either the existing air supply or hydraulic power from the central system.

B. F. Goodrich Aviation Products, Troy, New York. (Item 47)

News Items

Eagle Signal Corporation

Ray W. Bergholz has been named municipal sales representative for the state of Wisconsin by this Moline, Illinois manufacturer of timers and counters and traffic signal systems.

Mr. Bergholz is president of the Traffic and Parking Control Company, 2444 North 115th Street, Milwaukee, and has had a great deal of traffic control and electrical experience. He was actively engaged in the electrical supply business for more than 10 years prior to forming his own company, specializing in the new automatic, electric parking gates, as well as signs, markings and other equipment for the control of traffic and parking.

SAFETY PRODUCT LITERATURE

Portable Safety Dock Curbing

Eliminates the danger of material handling equipment being driven off truck docks or ramps. Also eliminates fixed curbing and loading locations. The 6 ft. sections are magnesium, weigh only 60 lbs. They can be handled by one man, and can be stacked one upon another. Literature gives full details. Magnesium Service Co., Rahway, N. J.

For more details circle No. 81 on enclosed return postal card.

Identification Signs

Porcelain enamel identification signs for trailer and truck are the subject of a new 4-page bulletin. Illustrates representative signs, and features technical section on attachment methods. Ingram-Richardson Mfg. Co., Beaver Falls, Pa.

For more details circle No. 82 on enclosed return postal card.

Aluminum Highway Railings

Compiled in a new booklet entitled "Alcoa Aluminum Highway Railways," the material encompasses all phases of the use of aluminum as railings on bridges and roadways. Over 30 models of parapet railing post designs are offered, including 18 available for the first time. With each of these new posts, complete photographic coverage of actual installations in every type of atmosphere across the nation is pictured. Engineering and architectural considerations are briefed along with the many advantages inherent in the use of the low cost, low maintenance aluminum alloys. A complete division of the new catalog is devoted to the problems of design for every conceivable installation. Two other sections are concerned with construction specifications and lists of materials. Aluminum Company of America, 1501 Alcoa Bldg., Room 727, Pittsburgh 19, Pa.

For more details circle No. 83 on enclosed return postal card.

Traffic Markers

Economarkers are easily and quickly applied to any surface in any month of the year with cold, quick setting Economastic. These long-wearing traffic markers are available in two thicknesses, various sizes, shapes, strips, legends, numerals and directional arrows. Catalog ESC-57 gives full details. Econo-Marker Corp., 820 Central Parkway, Cincinnati 14, Ohio.

For more details circle No. 84 on enclosed return postal card.

Controls for Traffic Signals

The Autoflow family of 102 controls includes types for all traffic control applications. All units feature Jack-Mounted Components, inter-changeability of common parts and multi-purpose operation. They may be used in interconnected or non-interconnected systems. Bulletin 5702 gives full details. Southern Signals, Inc., 222 Beach St., P.O. Box 1303, Shreveport, La.

For more details circle No. 85 on enclosed return postal card.

Lee Truck Tires

Catalog No. C-414, covers Lee's complete line of truck tires for on-and off-highway use. Included in 16-page booklet are facts about job payload performance. Lee Rubber & Tire Corp., Conshocken, Pa.

For more details circle No. 86 on enclosed return postal card.

Weigh-Tronic Scale Systems

Bulletin No. 509, lists features of Weigh-Tronic Scale Systems which allows vehicles to be weighed either moving or stopped. Taller & Cooper, 75 Front St., Brooklyn 1, N. Y.

For more details circle No. 87 on enclosed return postal card.

Truck Seat

Rubber torsional spring suspension truck seat brochure describes the Bostrom Level Ride 80 system in a flip-card style presentation. Bostrom Mfg. Co., 133 West Oregon St., Milwaukee 4, Wis.

For more details circle No. 88 on enclosed return postal card.

Liquid Handling Equipment

Catalog No. 65, covers loading arm assemblies, loading valves, swing joints, truck tank equipment, storage tank fittings and other products for the handling of bulk liquids. The 100 page book also contains full specifications, diagrammatic view and recommended applications on all standard products. Wheaton Brass Works, Springfield Road, Union, N. J.

For more details circle No. 89 on enclosed return postal card.

Specifications for Municipal Communications Control Signal and Power Cables

This new 208-page edition, known as the "Red Book" of the International Municipal Signal Association, includes the latest specifications for police communications and traffic and fire alarm systems. In addition, Kaiser approved specifications are given for 300-volt Laytex braided cables, 600-volt Laytex resin cables of the I.M.S.A. type and 300-volt Laytex resin cables. Kaiser Aluminum and Chemical Sales, Inc., 919 N. Michigan Ave., Chicago 11, Ill.

For more details circle No. 90 on enclosed return postal card.

New Device for Radio Phones

A new development by Motorola called "Dual-Squelch" has been added to its "Private-Line" radio phones. These radiophones, introduced two years ago by Motorola Communications and Electronics, Inc., 4501 W. Augusta Blvd., Chicago 51, Ill., are said to take a 2-way radio system off the "party line" occurring when more than one system shares frequency. Now the company has added a noise squelch to the "Private Line" equipment. With this, a fleet owner can modernize to a "Private Line" system on a gradual basis since during the transition period.

For more details circle No. 91 on enclosed return postal card.

Traffic Line Shaver

Literature describes a new machine for removing traffic pattern paint lines from highways and airfields. G. H. Tennant Co., 751 N. Lilac Drive, Minneapolis 22, Minn.

For more details circle No. 92 on enclosed return postal card.

Makes Measuring as Easy as Walking

For fast, accurate measurement data, the Rolatape measuring wheel may be used for such job applications as physical inventories, leakage surveys, street-opening surveys, locating paving cuts and general estimating work. In addition, a special model provides a quick way to measure traffic accident data. Rolatape Inc., 1741 Fourteenth St., P. O. Box 1190, Santa Monica, Calif.

For more details circle No. 93 on enclosed return postal card.

"Traffic Sentry"

Bulletin describes a portable traffic signal that can be rolled, hauled or taken by truck by one man to any location needing full traffic signal protection. Portable Traffic Signals, Inc., 1615 S. Broadway, Los Angeles 15, Calif.

For more details circle No. 94 on enclosed return postal card.

Safety Awards

Safe Driver Awards, Emblems, Plaques, and Pins, in many styles and sizes, are presented in a brochure available from Williams Jewelry & Mfg. Co., 10 South Wabash Ave., Chicago 3, Ill. Each item is pictured along with a complete description including sizes, components, and prices.

For more details circle No. 95 on enclosed return postal card.

Car-Call Mobile Receivers

Literature describes a highly-sensitive crystal-controlled receiver, completely self-contained in a smart two-tone grey steel case, with squelch circuit to quiet receiver between calls and standby switch to reduce battery drain. This radio receiver is ideal for use in trucking, petroleum and public utility communication systems, for monitoring police and fire calls by auxiliary and volunteer personnel, civilian defense agencies, and government officials, or as an auxiliary receiver in two-way systems. The set comes available in AM or FM units, pre-set to any frequency in 30 to 50 megacycle band. Seeley Electronics, 1060 S. La Brea Ave., Los Angeles 19, Calif.

For more details circle No. 96 on enclosed return postal card.

Circle Item No. 11—Reader Service Card

Trumbull County

From Page 35

the 79th Fighter Group at the Youngstown Air Base were active participants. The "Behind the Wheel" club at McKinley High School in Niles pitched in to make the safety-check an across-the-board community effort.

Publicity for the program blossomed. Newspapers in the county covered plans and denials of each community's safety-check as well as the overall county progress. Radio stations just across the state line in Sharon and Farrell, Pa., used spot announcements about the safety-check to alert their Ohio listeners. Station WHHH in Warren gave the safety-check news coverage, spot announcements, special interview programs and an appropriate prize — a radio — for the safety-check queen contest. Other merchants gave other attractive prizes for the queen and her court. Candidates from each high school in the county rode at the head of the parade and winner of the title "Miss Traffic Safety" was announced at the reviewing stand. The contest was based on personality, popularity at school, and a traffic safety essay.

The safety-check parade in Warren marked the opening of 38 check lanes in the county during safety-check week. There were six lanes in Warren, four in Newton Falls, and one in each of the other cities, villages, and townships in Trumbull County.

Officers of the traffic safety chapter left nothing to chance. They arranged for a private pilot to take care of the final reminder to motorists during safety-check week. A loudspeaker system was attached to a light plane. After mayors of all county communities had given their approval, the plane flew over the county booming out the message, "A safe car is a safety-checked car. Get your car safety-checked today."

Similar action programs will again be conducted this May in cities and counties throughout the 34 states which do not require motor vehicle inspection. As in past years, the safety-check will be sponsored nationally by the Inter-Industry Highway Safety Commmittee and *Look* Magazine, with the cooperation of the National Association of State and Provincial Safety Coordinators. National headquarters provides how-to-do-it manuals and other material to help cities and counties organize their safety-checks. Automobile and tire companies are making 20 or more men available to the Inter-Industry Committee for a 90-day period. The men will serve as special representatives and will travel in the 34 non-inspection states to help cities and counties organize safety-checks.

During the 1958 safety-check, Trumbull County and other participating cities and counties will stress safe driving as well as safe vehicles. Slogan for the forthcoming safety-check will be "Complete the Circle of Safety—Check Your Car—Check Your Driving — Check Accidents." Communities interested in conducting a safety-check can get help and additional details from National Vehicle Safety-Check for Communities, 1200 Eighteenth Street, N. W., Washington 6, D. C.

Campus Conference

Traffic safety problems of the college community will be among the matters discussed at the Fifth National Campus Safety Conference March 24, 25 and 26 on the campus of the California Institute of Technology in Pasadena, California.

People interested in and responsible for the prevention of accidents in junior colleges, colleges and universities throughout the United States will gather to discuss their accident problems and safety programs with others who are concerned with the college situation, learn what's being done at other schools to promote greater safety among students and personnel, and hear what experienced safety men and researchers have to say about particular aspects of college safety programs.

The meeting is sponsored jointly by the National Safety Council and Cal Tech. Charles W. Easley, safety engineer at Cal Tech, is in charge of planning for the Conference.

DRUNKEN DRIVING MUST STOP

Add to your present safety procedure

The Borkenstein

BREATHALYZER

The accurate provable way to determine whether alcohol is responsible for decreased efficiency or accident proneness. Let us give you a FREE Demonstration or send for pamphlet S-503

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For further information circle #78 on Readers Service Card

Circle Item No. 8—Reader Service Card

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SD-3 Two Tone Jewelers Bronze Etching on Genuine Walnut Shield 7¾" x 7¼" $6.50

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Circle Item No. 10—Reader Service Card

Circle Item No. 11—Reader Service Card

MAGNETIC

"VIZ-U-LIZER"

Board consists of (3) interchangeable sections—14" x 22" each—Enables you to simulate various intersections. Back has replica of 4 lane highway and blackboard surface for special situations.

World-wide acceptance by driver education instructors, insurance adjusters, lawyers, magistrates and safety engineers.

Scale model vehicles and traffic equipment supplied.

For details write

SALES AID CO.
149 Grayson Ave.
Dept. P — Trenton 9, N. J.

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REFLECTIVE
BICYCLE LICENSES

REFLECTIVE

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SELF-STICKING PERMANENT
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No Carbon Required. Either Triplicates with DON'T card or Quadruplicates.
No soiled fingers . . No bother . . No litter.
Bound in booklets for easy filing by number.

CARSTEN PRODUCTS
15406 THOMAS ALLEN PARK, MICH.

Circle Item No. 12—Reader Service Card

COMING EVENTS

Feb. 25-28, Urbana, Ill.

Forty-fourth Annual Illinois Highway Engineering Conference. Ass't. Dir. John W. Hutchinson, 305 Civil Engineering Hall, Urbana, Ill.

Feb. 27-28, Urbana, Ill.

Tenth Annual Traffic Engineering Conference. Dir. John E. Baerwald, 401 Civil Engineering Hall, Urbana, Ill.

Mar. 2-4, Memphis, Tenn.

Southern Safety Conference (Peabody Hotel). W. L. Groth, executive director. Southern Safety Conference, Inc., P.O. Box 8927, Richmond 25, Va.

Mar. 4-5, Boise, Idaho

Governor's Safety Conference (Hotel Boise).

Mar. 5-6, Philadelphia

Annual Regional Safety and Fire Conference and Exhibit (Bellevue-Stratford Hotel). Harry H. Verdier, executive director, Philadelphia Safety Council, Chamber of Commerce Bldg., 121 S. Broad St., Philadelphia, Pa.

Mar. 11-12, Atlantic City, N. J.

Eastern Regional Conference of the President's Committee for Traffic Safety.

Mar. 16-19, Dallas, Texas

Nineteenth Annual Texas Safety Conference (Adolphus Hotel). J. O. Musick, general manager, Texas Safety Association, Inc., 820 Littlefield Bldg., Austin, Texas.

Mar. 17-18, Boston

The 37th annual Massachusetts Safety Conference and Exhibit at the Hotel Statler, Boston; directed by Bruce Campbell, manager, and Bert Harmon, assistant manager. Massachusetts Safety Council, 31 State Street, Boston 9, Massachusetts.

Mar. 17-18, Los Angeles

Western Safety Conference and Exhibits. Joseph M. Kaplan, manager, Greater Los Angeles Chapter, National Safety Council, 3388 West Eighth St., Los Angeles 5, Calif.

Mar. 18-19, Ft. Wayne, Ind.

Northeastern Indiana Safety Conference and Exhibit. Ivan A. Martin, manager, Safety Council, Chamber of Commerce, Ft. Wayne 2.

Mar. 24-26, Pasadena, Calif.

Fifth National Campus Safety Conference. California Institute of Technology. Contact: Charles W. Easley, safety engineer, California Institute of Technology, 1201 E. Calif. St., Pasadena, Calif.

Mar. 25-27, Pittsburgh, Pa.

Thirty-third Annual Western Pennsylvania Safety Engineering Conference and Exhibit (Penn Sheraton Hotel). Harry H. Brainerd, executive manager, Western Pennsylvania Safety Council, 605 Park Bldg., Pittsburgh 25, Pa.

Mar. 25-28, Washington, D. C.

President's Conf. on Occupation-Safety. Contact: Dir., Bureau of Labor Standards, Dept. of Labor, Washington 25, D. C.

Apr. 1-2, Chicago

Mid-West Regional Conference of the President's Committee for Traffic Safety.

Apr. 8-9, San Francisco

Western Regional Conference of the President's Commitee for Traffic Safety.

Apr. 9-11, Gainesville, Fla.

Fifth Annual Conference on Accident Prevention Engineering (University of Florida). Donald B. Wilcox, conference coordinator, Dept. of Industrial Engineering, University of Florida, Gainesville, Fla.

Apr. 9-11, St. Louis, Mo.

Central States Safety Conference. (Hotel Chase) William F. Yorger, Managing Director Secretary, 722 Chestnut St., Suite 321, St. Louis, Mo.

Apr. 14-18, New York

Twenty-eighth Annual Safety Conference and Exposition of the Greater New York Safety Council (Hotel Statler). Paul F. Stricker, executive vice president, 60 East 42nd St., New York 17.

Apr. 15-18, Detroit

Twenty-eighth Annual Michigan Safety Conference (Sheraton Cadillac). Ben Duguid, executive secretary, Allstate Insurance Co., 16130 Northland Drive, Detroit 35, Mich.

Apr. 16-17, Indianapolis

Eleventh Central Indiana Safety Conference and Exhibit (Claypool Hotel). Jack E. Gunnell, director, Indianapolis Safety Council, Indianapolis Chamber of Commerce, Indianapolis 11, Ind.

ADVERTISER'S INDEX

Calumet Steel Castings Corp.....59
Carsten Products 64
General Motors Corp.....I.F.C.
Graubards, Inc. 57
Magno Saf-T Board.....59
National Safety Council.....I.B.C.
Porto Clinic Instrument Co..... 1
Sales-Aid Co. 64
Stephenson Corp. 63
Trippe Mfg. Co..... 2
U. S. Treasury.....B.C.
Wagner Electric Corp..... 2
Williams Jewelry & Mfg. Co.....63

Traffic Safety

FORMERLY PUBLIC SAFETY

Vol. 2 No. 1
March 1958

A NATIONAL SAFETY COUNCIL PUBLICATION

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The RESEARCH REVIEW is a quarterly supplement published by TRAFFIC SAFETY for the reporting of research that relates to traffic safety. This service is designed to provide those who conduct research, and/or utilize research findings, information that contributes to, advances, or clarifies the body of traffic safety knowledge. The value of research and the prevention of duplication and overlap is enhanced by prompt reporting. To fulfill this purpose, the RESEARCH REVIEW will present completed reports, abstracts, summaries of research in progress, and information regarding contemplated research.

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Manuscripts appropriate for publication should be submitted to the Research Division of the National Safety Council, 425 North Michigan Ave., Chicago 11. Manscripts cannot be returned unless accompanied by a self-addressed, stamped envelope. Editorial handling will be easier if manuscripts are typed, double-spaced in triplicate, and accompanied by an abstract of 200 words or less and all original art work. Any other information regarding research in progress or contemplated research can be submitted in any form that outlines the full particulars, i.e., investigator, problem, hypotheses, methodology, desired or expected outcomes, etc.

2 Safety Research Needed—Theodore S. Forbes

Highway and safety research which is not done exacts multiple payment.

3 Recently Presented Papers—

Authors and titles—37th Annual Meeting Highway Research Board

4 The Effect of Rest Pauses and Refreshment on Driving Efficiency—A. R. Lauer and Virtus W. Suhr

Preliminary study shows they have quieting effect, reduce tension, add alertness.

10 "On Board Accidents"—M. G. Bullock

Many falls occasioned by drivers avoiding traffic accidents.

15 Consolidated Report on Traffic Safety Research—Charles W. Prisk and Leon Brody

President's Committee for Traffic Safety Public Officials Conference Report.

18 Ways and Means of Forecasting Accident Trends—Clifford O. Swanson and A. R. Lauer

Pilot study in the area of accident-trend analysis.

22 An Experiment in Reorienting Driver Attitudes in Teen-Age Drivers—George A. Nothhelfer

Changed attitude, more mature thinking noted among experimental group.

24 Development of a Criterion for Driving Performance—A. R. Lauer, Virtus W. Suhr and Earl Allgaier

Preliminary study shows driving performance can be measured.

28 Traffic Safety Research Projects

Annual listing of research projects of which NSC has knowledge.

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SAFETY RESEARCH NEEDED

by Theodore S. Forbes

Dr. Theodore W. Forbes is an assistant director of the Highway Traffic Safety Center in charge of research.

For the past 25 years Dr. Forbes has been a teacher, lecturer and researcher specializing in highway traffic psychological and engineering problems. Prior to joining the Center Staff he was with the American Institute for Research where he was program director in charge of highway research.

He received the A.B. and M.A. degrees from Oberlin College; the Ph.D. from Ohio State and was certified in traffic engineering at the Harvard Traffic Bureau.

Dr. Forbes is committee chairman on Road User Characteristics of the Highway Research Board; member of the advisory subcommittee on research, President's Traffic Safety Committee; member of the American Psychological Association; associate member of the Institute of Traffic Engineers and technical director of the committee on Highway Safety Research of the National Research Council.

PROGRESS in any field can be accomplished through two systems of attack: by increasing the efficiency of old methods, and by developing new methods. Though it is often easier and less expensive to improve old methods, the greatest advances usually require new techniques.

For example, development of better piston-engined aircraft was continuous up to a point—beyond that, a major improvement in aviation required the development of turboprop and jet aircraft. Achieving this required much new information from long-time continuing research.

Recent developments in electronics, in television, and in many sciences are already being used to improve traffic safety and highway efficiency. The safety and efficiency of today's motor vehicle to a large extent is the by-product of the automotive industry's developments on the proving grounds and in the mechanical laboratories. Similar physical research has brought improvement in the construction and maintenance features of highways and bridges with correlated progress in safety.

These things add up to improvements of the old, known methods.

Research on the Driver Inadequate

Until recently, no comparable research has been done on the driver as an integral part of the transportation system in dealing with the problem of highway operating efficiency and safety. Limited applications of the principles of psychology, in vision, in learning and in training have been made but the emphasis has been on "cracking down" on the driver rather than on finding out why he does apparently unexplainable things.

It has been established that you pay for good highways whether you have them or not—because of the costs occasioned by poor ones. Highway and safety research which is not done exacts multiple payment. The cost of traffic accidents in Michigan for the *past ten years* is estimated at $1,745,000,000. The cost for the nation during the *past year alone* is estimated at over $5,000,000,000. These costs are based on wage losses, medical fees and hospital expenses, insurance claims and property damage. They are part of the cost of motor vehicle operating expenses today. Business and industry have found it pays to invest a minimum of 1% of operating expenses in research, but only a fraction of this amount has been spent on highway safety research.

No Reason Solution Cannot Be Found

The comment is often made that after you find how people react you cannot do anything about it, because of human nature. While the failings of human nature may account for much of the safety problem today, there is no reason to believe a solution cannot be found, once the necessary research is accomplished.

Sometimes human deficiencies can be compensated through a physical change in the design of the vehicle or the highway. Recent research on the causes of injuries in automobile collisions resulted in the development of seat belts, door latches which do not readily open in collisions and dished steering wheels, all of which help minimize certain types of injuries.

To Page 32

*Originally published in the *MSU Center Letter*, of the Highway Traffic Safety Center, Michigan State University, East Lansing, Mich.

RECENTLY PRESENTED PAPERS

BELOW is a selected listing of papers which may be of value and interest to researchers in the traffic safety field. These papers were presented at the 37th annual meeting of the Highway Research Board in Washington, D. C., during the period of January 6-10, 1958.

The titles are presented in the RESEARCH REVIEW in order to bring the most recent developments in the field to the attention of a wider audience.

The National Safety Council has neither abstracts nor copies of these papers. Anyone desiring copies would have to correspond directly with the authors.

A Color Comparator for Lights in the Vicinity of Traffic Signals
D. M. Finch and Jerry Howard
Institute of Transportation and Traffic Engineering, University of California

Optical Properties of the Atmosphere and Highway Lighting in Fog
B. S. Pritchard and H. R. Blackwell
University of Michigan

Night Legibility Distances of Highway Signs
Terrence M. Allen
Virginia Council of Highway Investigation and Research, Charlottesville

Night Vision Studies at Harvard University
Ross A. McFarland
Harvard University

Efforts to Improve Visibility in Fog—A Movie Presentation
C. R. Marsh
Pennsylvania State University

Travel Characteristics of Two San Diego Subdivision Developments
Edward M. Hall
City of San Diego, California

Factors Affecting Trip Generation in Residential Use Areas
Gordon B. Sharpe, Walter Hansen, and Mrs. Lamelle B. Hamner
Bureau of Public Roads

Estimating and Forecasting Peak Hour Travel
Alan M. Voorhees
Automotive Safety Foundation

Transportation Usage Study
W. J. Mortimer
Cook County Highway Dept., Chicago, Ill.

Evaluating Trip Forecasting Methods with an Electronic Computer
Glenn E. Brokke and Wm. L. Mertz
Bureau of Public Roads

City Center Goods Movement
E. M. Horwood
University of Washington

Driver Characteristics and Speed Performance Related to the Facility
Donald E. Cleveland
Bureau of Highway Traffic, Yale University

The Role of Psychological Factors in Motor Vehicle Accidents
Robert V. Rainey
University of Colorado

The Relationships Between Driving Records, Selected Personality Characteristics and Biographical Data of Traffic Offenders and Non-Offenders
Earl D. Heath
New York University Center for Safety Education

Age and Fatal Motor Vehicle Accidents
Clifford O. Swanson, Iowa State Dept. of Public Safety; Mrs. Lillian C. Schwenk, and A. R. Lauer, Iowa State College

Final Report: Study on Effect of a Periodic Refreshment Pause on Simulated Automobile Driving Performance Efficiency
Virtus W. Suhr
Iowa State College

Traffic Accidents and Quality of Traffic Flow
Bruce D. Greenshields
University of Michigan

Economic Cost of Different Type Motor Vehicle Traffic Accidents
Robie Dunman
Bureau of Public Roads

Statistical Evaluation of Traffic Accident Severity
Edmund J. Cantilli
The Port of New York Authority

An Analysis of One-Car Accidents
R. W. Bletzacker and T. G. Brittenham
Ohio State University

Predicting Traffic Accidents from Roadway Elements on Urban Suburban Extensions of State Highways
J. Al Head
Oregon State Highway Dept.

Traffic Flow in Tunnels
Leslie C. Edie and Robert S. Foote
The Port of New York Authority

Measurements of Driver-Vehicle Behavior and Effects on Traffic Flow
Theodore W. Forbes, Henry J. Zagorski, E. L. Holshouser, and W. A. Deterline
American Institute for Research
Pittsburgh, Pa.

Direct Evaluation of Geometric Highway Design
Siegfried M. Breuning and A. J. Bone
Massachusetts Institute of Technology

Driver Response to Radar Brakes
John Versace, Leonard Gau, and George Platzer
Chrysler Corporation

Electronic Control of Motor Vehicles on the Highway
V. K. Zworykin, L. E. Flory, RCA; and L. N. Ress, Nebraska Dept. of Roads & Irrigation

A Comparative Study of the Highway Research Board Statistical Instrument and a Modified Speed and Delay Recorder
Adolf D. May, Jr., and Edwin T. Kaneko
Michigan State University

Sampling Procedures for Determining Speed Characteristics at Rural Locations: A Progress Report
Joseph W. Guyton and A. K. Stonecipher
University of Illinois

Minnesota Experience in Counting Traffic on Low-Volume Roads
James E. P. Darrel, W. J. Hayne, and Ralph Dale, Minnesota Dept. of Highways

Observations on Urban Traffic Volume Patterns in Tennessee
Boris B. Petroff and Anthony P. Kancler
Bureau of Public Roads

THE EFFECT OF REST PAUSES AND REFRESHMENT ON DRIVING EFFICIENCY*

by A. R. Lauer and Virtus W. Suhr

Driving Research Laboratory,
Industrial Science Research Institute
Iowa State College, Ames, Iowa

Problem

REST pauses have been effectively utilized in certain industries to combat the loss in worker efficiency due to fatigue and monotony. Although there is not complete agreement as to the optimum length of time for the pause or where it should be introduced in the work period,[8] few will deny its practicality.

Early research[6] has shown that long automobile drives tend to produce a loss of efficiency of certain discriminations, association processes, and motor reactions similar to those required in driving. These observations also suggest that a long automobile drive may render a driver temporarily susceptible to accidents. Much has been attributed to highway hypnosis with very few experimental facts available. One study by Lauer and McMonagle[5] touched on certain aspects of the problem.

Reports by certain insurance companies operating throughout the country indicate that a large percentage of their accidents occur during the first three hours of driving. Their insured are for the most part commercial drivers who start on a trip and drive for several hours. For lay drivers this would not be very convincing since it is conceivable that most of their trips are completed within a period of three hours.

It was deemed advisable to set up an experimental situation such as to determine what effect, if any, the introduction of a rest pause with refreshments at regular intervals would have on the efficiency of automobile drivers.

This is the first phase of a special study on the effect of refreshment pauses on driving efficiency and will cover only the orientation and practice period of approximately six hours duration. Three hours were spent behind the wheel in a stimulated driving situation. The remainder of the time was spent in orientating and testing the subjects on a battery of efficiency tests.

Method and Procedure

The method was that of a controlled experimental approach using matched groups to determine the nature of their performance in a simulated driving situation continuing for a three-hour period. While it was impossible to match the groups exactly, they were matched as nearly as possible with respect to sex, age, and driving experience.

Thus two groups of 28 and 25 subjects respectively, used in the practice run, are hereby included and the results, from their performance, will be considered in terms of (a) nature of their efficiency curves on several aspects of simulated driving as described, and (b) basic efficiency measurements made before and after the driving period of three hours.

These two sets of measurements were made in order to determine, if possible, what psychological effects might result from a period of three hours performance with and without pauses such as are described.

One group of 28 subjects, used as a control, drove for three hours straight, receiving no rest pause or refreshments. Henceforth, they will be designated as the no-pause group. The other 25 subjects, making up the experimental group, were served tea just prior to the driving period. After one and one-half hours of continuous driving, each was given a 15-minute rest period during which time tea was again served. The drivers following this procedure will be referred to as the refreshment-pause group.

Factors Considered

The experimental procedure consisted of administering a series of efficiency tests to each driver before and, again,

*This study was made possible through grants for driving research to Iowa State College by Thomas J. Lipton, Inc., and Allstate Insurance Company.

after the simulated driving phase of the study. Included among the tests were:

1. *The steadiness test.* The subject moves a stylus downward through a gradually narrowing slot between two metal strips. The distance that the subject moves the stylus downward without touching the sides determines his score for that trial. A series of ten trials, alternating hands each trial, constituted the test. The average score is used as the index of steadiness of muscle control or lack of tremor.

2. *Choice reaction time.* The subject is seated with the right foot placed on a break-type switch adjacent to a simulated brake pedal. He is instructed to hold his right foot on the switch just as though he were pressing the accelerator of an automobile.

Green, amber, and red stimulus lights are presented in random order. The subject is instructed to respond only to the red light, that is, as soon as the red light appears, to move his right foot from the switch and place it on the brake pedal as quickly as possible.

Reaction time to the red light is recorded. False reactions, such as responding to a green light, are counted by an electronic device. The test continues until the red light is presented 25 times. Several amber and green lights are given as distraction stimuli. The number of presentations is constant for each subject.

3. *Coordination.* This is measured with a device developed at the Driving Research Laboratory for use with Army drivers. A platform maze is controlled by means of two levers. One moves the tilting top upward or downward from front to back. The other tilts it in a similar manner from side to side. A steel ball bearing, 7/8 inch in diameter, can be guided around the maze by manipulating the levers. At various places along the courses, holes are located through which the ball will drop, if the levers are not manipulated properly to maneuver the ball around them. The object is to guide the ball bearing through the maze without its falling into one of the holes. There are 20 holes numbered 5, 10, 15, 20, etc., up to the end dock which is 100.

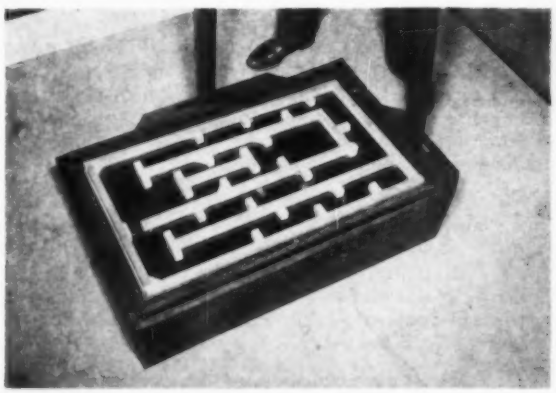


Figure 1. The Coordinometer.

The Coordinometer is shown here as it sits on the floor with a subject operating it by means of the upright levers. The table is tilted to the right or left by one lever, and backward or forward with the other lever as desired. A steel ball is guided around the path to the "dock." This simulates the manner of a trucker moving his truck around through alleys to get to a certain place where he backs in. It was used in a study of Army drivers.

The holes are numbered progressively so that the further the ball has advanced around the maze before it falls through a hole, the higher the score. Thus, the number at the hole where the ball is lost determines the score for the trial. Each subject is given five trials and the average is used as a score. It is postulated that this device measures motor control, carefulness and perseverence, along with perceptual accuracy and attention.

4. *Blood pressure.* The Tycos Self-Recording Sphygmomanometer was used for measuring blood pressure. This instrument is particularly adapted for use in this type of study since it makes a graphic recording that can be studied by more than one person and increases objectivity in the analysis of results.

5. *Galvanic skin response, pulse, and respiration.* A Stoelting No. 22496 Deceptograph was used for obtaining these measurements. The subject is seated comfortably in a lounging chair and told to relax as much as possible. A pneumatic cuff is placed around one wrist and inflated sufficiently to bring out the pulse beat.

The pneumograph, a black rubber, convoluted tubing with suitable attachments, is fastened around the chest tight enough so as to stretch and contract as the subject breathes. A finger electrode is attached to the middle finger of each hand in order to obtain a measurement of skin resistance. A record of the pulse, respiration and galvanic skin responses is thus obtained for a period of one minute for each measurement—both before and after the driving period.

After the preliminary efficiency tests, each subject in the refreshment-pause group was taken into a booth built to resemble a small roadside stand where tea was served, with or without additives as desired. The subject was allowed to drink the tea at his leisure, second servings being made available, if desired. The no-pause group went directly from the efficiency tests to the simulated driving phase of the study.

The driving performance was done in the laboratory. The apparatus used was the Drivometer (described by Lauer, et al, references 3, 4 and 5) and located in a special booth, designed at Iowa State College, for measuring and recording the reactions of drivers under laboratory conditions. The Drivometer is a device so constructed that the subject sits in a mock-up car using *full-size automobile controls* to drive a *miniature car* around a traveling roadway.

The special booth built around the Drivometer is designed to provide proper controls of the simulated driving conditions. The booth is air conditioned and the temperature kept at 70 degrees. The relative humidity averages around 57 per cent.

In order to compute a steering score, vertical protrusions are attached to the right side of the roadway in such a fash-

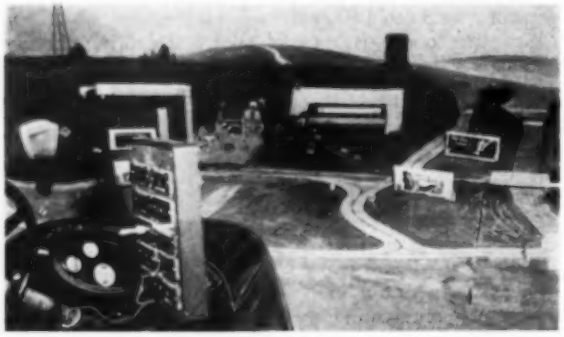


Figure 2. The Drivometer.

This is one view of the Drivometer, simulating driving practice, which is housed in an air conditioned booth. A standard steering wheel and controls are used to maneuver a small car over a miniature highway which is shown directly ahead of the driver. One of the stimuli which are used for distraction is an electric train which moves across the bridge on the highway at certain intervals. The driver reacts when it emerges from the tunnel at the left.

ion that, when the miniature car crosses one, it operates a quick-acting counter. The total number of contacts made constitutes the *steering score*. Thus the degree to which one keeps the car on the road is objectively recorded.

A signal box containing a red and green light similar to conventional traffic control devices is placed above and to the right of the traveling roadway. The time required for the subject to depress the brake pedal after a red light appears in the signal box is described as *stop-light-response time*.

A Lionel electric train is installed in the special booth on the mock-up landscape so that it can be made to emerge from a tunnel into the view of the driver at the will of the experimenter. The driver is instructed to depress the brake as soon as he sees the train.

As the train leaves the tunnel an electric contact starts a standard time clock calibrated in terms of 1/100 second which is stopped when the brake pedal is first depressed. The time elapsing has been designated in this study as *train-reaction time*.

Located above the roadway is a small aperture through which printed instructions are presented. To the right of the driver is a control box on which is printed another set of each of the instructions which appear in the aperture. The subject is instructed to stop the car as soon as he sees instructions appear in the aperture and plug in a jack below the matching instructions on the control box. Then he follows the directions as stated. The time required for the subject to note and read the instruction line, comprehend it, and plug in as instructed constitutes the *error time*.

At the beginning of the driving phase, a control test run covering the series of seven instructions is made. During this time, the red light and the train are each presented on five different occasions. The time required for the driver to perform the exercises as outlined in the instructions is measured by a second standard time clock and recorded as the *total-trip time*. This series of evaluations will henceforth be referred to as a test-run. The before and after test-runs yielded the following data:

1. *Steering score*
2. *Stop-light-response time*
3. *Train-reaction time*
4. *Error time*
5. *Total-trip time*

The Work Periods

The subjects were told to drive the Drivometer just as they would on the open highway as soon as the instructions ceased to appear in the aperture at the end of the test-run. The stop-light and train are consistently presented five times each half hour. These half-hour intervals of simulated driving are called work-periods.

After one and one-half hours of continuous driving, the subjects in the refreshment-pause group are given a 15-minute rest period and again served tea as previously described. The no-pause group drive for three hours straight.

Ten minutes prior to the end of the last work-period, a second test-run is given. As soon as the simulated driving phase is completed, the efficiency tests are administered again in the same sequence as followed before, thus completing the experimental cycle in this, the first phase of the study. The subjects are paid standard wages by the hour for the time taken by the experiment—about six hours for the practice run.

Treatment of Results

The mean scores on the factors measured during the test-run and also the mean scores on the factors measured by the efficiency tests were computed for the two groups, both before and after the driving period. The differences between the before and after group mean scores were computed for each variable measured for both the refreshment-pause and the no-pause group. A t-test with pooled variance was made to determine whether the differences found were statistically significant.

No attempt was made to determine the significance of group differences in this phase of the study. They are being considered in the main experimental run during which each subject spent six hours behind the wheel. The objective in this phase of the study was to determine the nature and extent of practice effects and/or decrements on the various measures used.

The factors measured during the work-periods were analyzed graphically so that not only the differences but also any changes in direction of performance could be revealed.

The mean scores, differences between the means, the t-values for the factors measured during the test run are shown in Table 1 for the refreshment-pause group and in Table 2 for the no-pause group.

Table 1

TEST-RUN—REFRESHMENT-PAUSE GROUP

(Made to establish the presence of practice effects and/or decrement)

Factor	Mean Before	Mean After	$M_b - M_a$		t-value
Total-trip time	4.716	4.212	.504	A†	1.115
Error time	1.153	.838	.315	A	2.067*
Stop-light-response time—mean	2.122	2.145	— .023	B	.032
Stop-light-response time—A.V.	2.060	2.632	— .572	B	.401
Steering	99.760	103.800	—4.040	A	.348
Train-reaction time—mean	.924	.936	— .012	B	.063
Train-reaction time—A.V.	.788	.640	.148	A	.851

*Significant at the five percent level.
†A = increment or improvement.
B = decrement or loss.

Table 2

TEST-RUN—NO-PAUSE GROUP

(Made to establish the presence of practice effects and/or decrement)

Factor	Mean Before	Mean After	$M_b - M_a$		t-value
Total-trip time	4.726	4.207	.519	A†	1.312
Error time	1.081	.878	.203	A	1.436
Stop-light-response time—mean	3.128	1.319	1.809	A	2.131*
Stop-light-response time—A.V.	3.938	.706	3.232	A	2.763**
Steering	83.214	87.036	—3.822	A	.420
Train-reaction time—mean	1.139	1.024	.115	A	.699
Train-reaction time—A.V.	.820	.619	.201	A	1.021

*Significant at the 5 percent level.
**Significant at the 1 percent level.
†A = increment or improvement.
B = decrement or loss.

The *error time* was significantly less on the second test run for the refreshment-pause group. Since this was the first time any of the subjects had driven the Drivometer, it is probably due to practice effect and learning rather than to an increase in efficiency. The purpose of this phase of the study was to practice all subjects.

The significantly faster *stop-light-response time* on the second test run for the no-pause group as compared to the very low t-value indicating no change for the refreshment-pause group seems to substantiate previous findings (7) suggestive of a calming effect from the ingestion of tea. This may be an indication that tea has a beneficial effect on driving performance. The National Safety Council has cited data indicating that reaction time is related to accident rate with the quick reactors having the higher rate.

Table 3

EFFICIENCY TESTS—REFRESHMENT-PAUSE GROUP

(Before and after practice run)

Factor	Mean Before	Mean After	$M_b - M_a$		t-value
Blood pressure					
Systolic	127.360	125.280	2.080	A†	.263
Diastolic	66.120	66.800	— .680	B	.324
Steadiness	8.128	8.820	— .692	A	1.144
Choice reaction time					
False attempts	2.560	2.040	.520	A	.524
Mean	38.297	37.670	.627	A	.358
A.V.	7.313	6.262	1.051	A	1.731
Coordination	43.400	46.280	—2.880	A	.356
Pulse					
Rate	78.160	70.920	7.240	B	2.865**
Regularity	1.007	1.015	— .008	B	.707
Oscillation	1.200	1.120	.080	B	.395
Bridge Measurement	102150.400	99016.800	3133.600	B	.063
Respiration					
Frequency	15.120	15.240	— .120	B	.084
I/E Ratio	.767	.733	.034	B	.412
I/E Variability	.287	.157	.130	A	2.029*

*Significant at the 5 percent level.
**Significant at the 1 percent level.
†A = increment or improvement.
B = decrement or loss.

Table 4

EFFICIENCY TESTS—NO-PAUSE GROUP

(Before and after practice run)

Factor	Mean Before	Mean After	$M_b - M_a$		t-value
Blood pressure					
Systolic	132.000	120.071	11.929	A†	1.835
Diastolic	67.893	66.143	1.750	A	.764
Steadiness	8.028	7.982	.046	B	.110
Choice reaction time					
False attempts	1.678	.786	.892	A	2.730**
Mean	38.840	39.924	—1.084	B	.675
A.V.	7.876	7.417	.459	A	.534
Coordination	43.464	46.750	—3.286	A	.427
Pulse					
Rate	75.750	71.178	4.572	B	1.786
Regularity	1.002	1.006	— .004	B	.100
Oscillation	.928	.964	— .036	A	.161
Bridge Measurement	101580.357	112371.071	—10790.714	A	.089
Respiration					
Frequency	15.178	15.214	— .036	B	.031
I/E Ratio	.775	.772	.003	B	.071
I/E Variability	.335	.401	— .066	B	.584

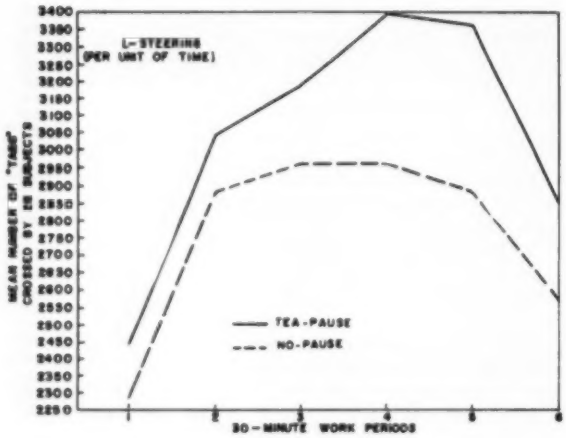
**Significant at the 1 percent level.
†A = increment or improvement.
B = decrement or loss.

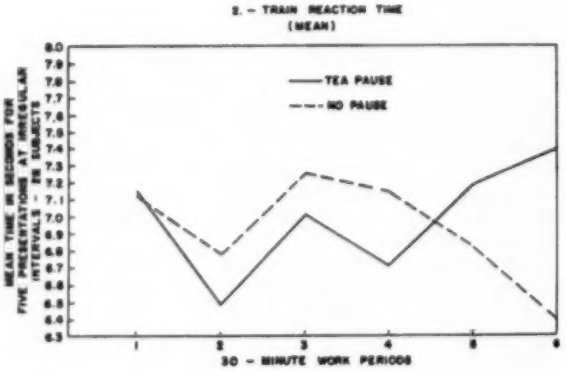
The highly significant decrease in choice-reaction time *false attempts* by the no-pause group is contrary to previous

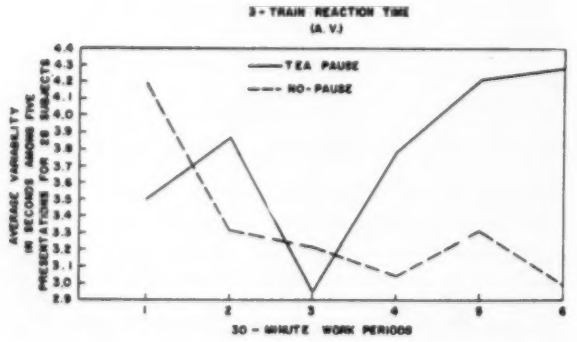
findings and against expectations. No satisfactory explanation can be offered for this observation.

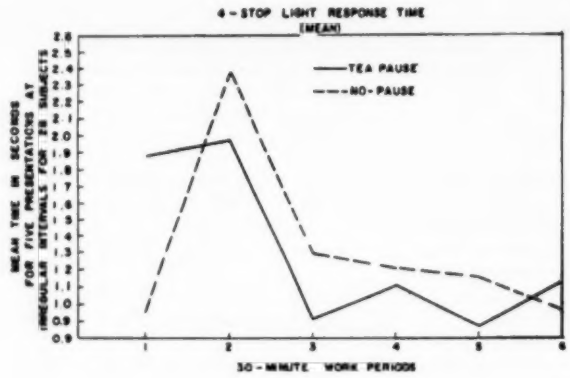
The highly significant decrease in pulse rate as well as the significant decrease in breathing variability by the refreshment-pause group seems to indicate a lower level of tension which would possibly have a favorable effect on driving by lessening fatigue.

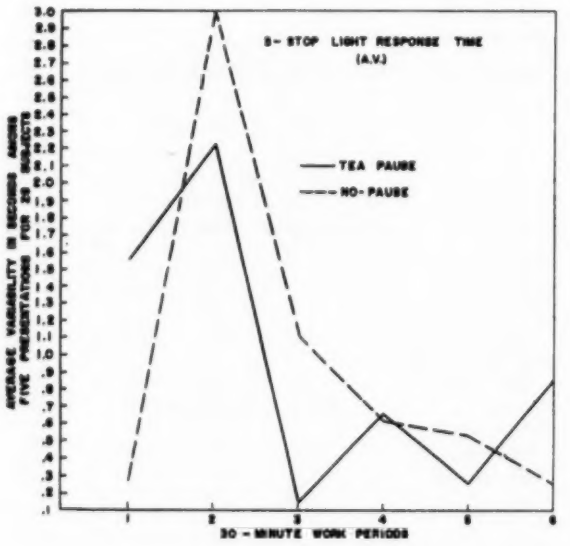
The results recorded for the factors considered during the work period are presented graphically.

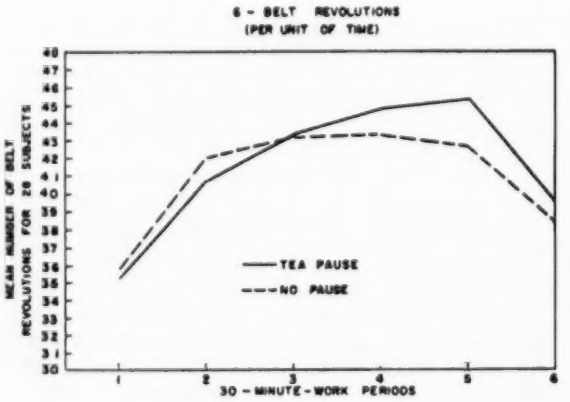


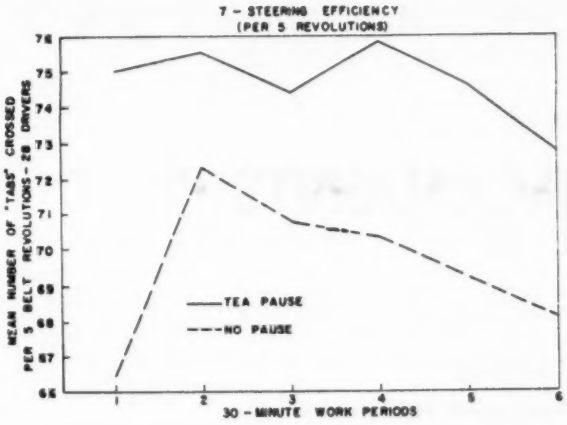

2 – TRAIN REACTION TIME
(MEAN)
MEAN TIME IN SECONDS FOR FIVE PRESENTATIONS AT IRREGULAR INTERVALS - 28 SUBJECTS
TEA PAUSE
NO PAUSE
30 – MINUTE WORK PERIODS


3 – TRAIN REACTION TIME
(A. V.)
AVERAGE VARIABILITY IN SECONDS AMONG FIVE PRESENTATIONS FOR 28 SUBJECTS
TEA PAUSE
NO-PAUSE
30 – MINUTE WORK PERIODS


4 – STOP LIGHT RESPONSE TIME
(MEAN)
MEAN TIME IN SECONDS FOR FIVE PRESENTATIONS AT IRREGULAR INTERVALS FOR 28 SUBJECTS
TEA PAUSE
NO-PAUSE
30 – MINUTE WORK PERIODS


5 – STOP LIGHT RESPONSE TIME
(A.V.)
AVERAGE VARIABILITY IN SECONDS AMONG FIVE PRESENTATIONS FOR 28 SUBJECTS
TEA PAUSE
NO-PAUSE
30 – MINUTE WORK PERIODS


6 – BELT REVOLUTIONS
(PER UNIT OF TIME)
MEAN NUMBER OF BELT REVOLUTIONS FOR 28 SUBJECTS
TEA PAUSE
NO PAUSE
30 – MINUTE – WORK PERIODS


7 - STEERING EFFICIENCY
(PER 5 REVOLUTIONS)
MEAN NUMBER OF "TASS" CROSSED PER 5 BELT REVOLUTIONS - 28 DRIVERS
TEA PAUSE
NO PAUSE
30 - MINUTE WORK PERIODS

The graphs indicate the trend of the work curves throughout the three-hour period. The tabulations were made at 30-minute intervals, hence the graph shows a progressive account of performance. Appropriate methods of evaluation of these trends are being considered, both parametric and nonparametric[1].

Summary and Conclusions

Two groups of 28 and 25 subjects respectively were given a practice run of three hours simulated driving on the Drivometer which was installed in a special air-conditioned booth at the Driving Research Laboratory, Iowa State College. A series of efficiency tests were administered both before and after the simulated driving period.

One group of drivers, the refreshment-pause group, was served tea just before the driving phase of the study and again during a 15-minute rest period after one-and-one-half hours performance. The other group received no rest pause or refreshments. Data were recorded on both groups every half hour during the simulated driving period for the factors that could be subjected to continuous evaluation.

The variables that lent themselves to statistical evaluation were so analyzed. The other factors were analyzed graphically to determine the nature, extent and direction of trends in performance.

A point regarding significance should be mentioned. Without an unduly large number of cases, small differences which are found between two sets of means may not show significance by use of the t-test or comparable tests of significance. When curves such as are shown consistently indicate a small difference at a number of different points, ordinary two-group comparison methods do not seem to apply. Further study is being made of evaluation methods suitable to the data.

In interpreting the results, it must be remembered that the data herein presented were gathered during the orientation and practice period preliminary to the main experimental run which involved two groups of 28 subjects each taken through a nine-hour experiment. This study will be reported later. However, the findings seem to support a general tentative conclusion, namely, that the general effect of the tea and the pause combined has a quieting effect which may be reflected in (a) the tendency to work a little harder, (b) sustained alertness, and (c) greater efficiency at the problem at hand. From several phases of the study there is some evidence of a quieting effect and reduction of tension for the refreshment-pause group. Further interpretations are being withheld pending the completion of analysis of the experimental run.

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ON BOARD ACCIDENTS

by M. G. Bullock

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THE scope of this paper will cover primarily these essential fields of the subject, namely:

1. Conclusions we have tentatively reached as based upon a special survey of circumstances surrounding on board passenger accidents, which we have been currently conducting at the St. Louis Public Service Company, plus results of a similar survey of less scope conducted a few years ago.
2. A review of programs for control of on board passenger accidents.
3. "On Board" accidents, in our discussions, *will exclude* "Boarding," "Alighting," and "Struck by Door" type of occurrences. The city transit property used in this latest survey operated approximately 30,000,000 miles in 1956.

Now that I have broadly outlined the general scope of my presentation, I will explain how our current survey has been conducted.

In April of 1956, we introduced a special questionnaire of nine questions, to be answered by the operator involved in an "On Board" accident. The division superintendent, or assistant, was assigned to do the interrogation.

In October of 1956, we decided to check the accuracy of our results from the operator's observations, thus a questionnaire of nine similar questions was introduced for use by adjusters, when interviewing or securing statements from persons making a claim from an "On Board" type of accident. We felt that the person involved, namely the person claiming injury, should have the best information as to his, or her, actions prior to the fall or bump.

The current survey to-date covers about 500 bus and streetcar accident reports by operators, and approximately 100 interviews with claimants.

Bus Service Illustrated

As bus operation predominates in the industry, my illustrations in this discussion will center mainly around this type of service, with primary reference to the data secured from claimants, unless otherwise indicated.

Our special survey has verified the results of some prior studies, and also disclosed a few new facts that were a little surprising. *Our study* of the bus accidents, for instance, portrays the following:

1. Data from operators indicate that six out of 10 "On Board" accidents were falls or injuries caused by a stopping action of the bus, and that at least ⅔ of the "falls" caused by stopping were averted traffic accidents. Claimants, on the other hand, distribute the cause approximately equally by starting, stopping, and running straight action of the vehicle.
2. One-half of the people were standing at the time of their accident; 30 per cent were sitting, and 20 per cent were walking. (If walking, most were walking to the rear.) (Only 4½ per cent admitted to changing their seat.)
3. Two-thirds of the claimants admitted they were not holding on to a stanchion or support at the time of their "On Board" accident.
4. Eighty-four per cent of the claimants said a stanchion or support was within easy reach. (Operators' data portray 79 per cent—so rather close as to opinion.)
5. Of those using a support only three per cent used the over-

Presented at ATA REGIONAL CONFERENCE, Toledo, Ohio, 1957.

head rod; 45 per cent used a stanchion; 40 per cent a seat handle, and others couldn't remember. (The data from operators is very close to these figures.)

6. Fifty-five per cent to 65 per cent of the "On Board" accidents resulted in a fall to the floor. Operators claim the higher ratio of 65 per cent.

7. Three-fourths of the "On Board" *accidents* involved women. Of the "On Board" *claims* presented, however, 85 per cent represent women. This implies women are more apt to make a claim. Sixty per cent of the "On Board" claims were presented by persons over 50. Fifteen per cent were 70 or over in age. (Mostly women, as previously noted.)

   A few years ago I made a study of streetcar and bus *alighting* accidents, and the ratio of women involved were: Bus, 80 per cent; streetcar 70 per cent, average 76 per cent.

   I recall that Dor Williamson made a study at Kansas City in 1955 and came up with a ratio of 80 per cent (women).

8. Fifty-eight per cent were carrying something, usually a purse. (Operators said 65 per cent.) Mer Kraft's surveys in the past have shown that women usually carry objects in the left hand. One of our prior studies produced a similar conclusion.

9. Although more "On Board" *accidents* occur in the center section of the bus, the area immediately to the rear of the fare box and the operator, produce the greatest number of *claims*. It was rather surprising that the area to the rear of the center exit door developed 19 per cent of the claims.

As most everyone in the industry knows, it is useless to gather statistics, unless they can be put to practical use. Data that I have secured from other properties, plus reading of the fine paper by Howard Baker, that he gave at the National ATA Convention in 1955, on the subject of "Passenger Accidents," leads me to believe that far more emphasis should be placed on the control of "On Board" accidents in the industry.

Safety activity must be geared to cost control. (That's one reason why we frequently check with our claims people for data relating to accident costs). If one looks only at the accident *frequency* of "On Board" accidents for illustration, this could prove to be a "sleeper." We must always remember that management wants cost reduction as the end result. For instance, on two large properties, "On Board" accidents constituted about 14 per cent of the total *number* of all types reported, but they created about 23 per cent of their total claims costs. (As noted earlier, "On Board" accidents in our terminology excludes boarding, alighting, and struck by door occurrences).

Falls—"High Cost" Accident

In addition, it has been our observation that "falls or bumps, as a result of stopping" usually emerges on most properties as the "high cost" type accident, out of approximately a total of 70 traffic and passenger accident classifications which we use. In fact, Carl Sypher, in developing his Accident Rating Plan, logically assigned a rate equal in importance to intersection accidents.

Over the years, the subject of stanchions and grab rods, etc., has often been discussed. Our current survey more or less verifies a study I made some years ago, in that I found no positive correlation between passenger "On Board" accidents and the number and placement of stanchions. This study did indicate, however, an increased ratio of "On Board" falls when stanchions were practically nonexistent. You will recall, possibly, that the current survey shows that 64 per cent were not holding to a support, yet 85 per cent admitted a support was available. The greatest problem, therefore, appears that we must encourage passengers to use the supports provided.

This same prior study disclosed no positive pattern of passenger "On Board" falls as related to the relative deceleration rate from brakes. We did discover a direct pattern of reduced traffic collision frequency, however, as related to the braking efficiency. In other words, buses with efficient brakes produced a lower traffic collision rate.

I am of the opinion that a pattern for "On Board" falls, as related to equipment design, did not become apparent because a multitude of other factors existed. Other factors included the operator, the passenger, street traffic, etc. We should remember, however, that only three per cent say they used the overhead rod for support (if they used any). Thus, stanchions and grab rods should be easily accessible and comfortable to use. In other words, tailor them to fit elderly ladies, as noted in the survey.

Our current study shows that many passengers admit a stanchion or grab handle in most cases was available, but not used. Thus, this seems to indicate a real necessity for intensified passenger education. In present day traffic, it is impossible to maintain the floor of the transit vehicle with the same degree of stability as the living room floor, thus passengers should always seek support.

Our adjustors, by the way, report favorable reaction by claimants when they interview them in connection with our "safety questionnaire." They seem impressed that we are attempting to secure information to help prevent similar "On Board" occurrences.

When our study discloses that the typical passenger involved in an "On Board" fall, is usually a lady, and usually over 50 years of age, frequently caused to fall because the operator is trying to avert a traffic accident, then our control program should be also aimed at the transit operator, to encourage greater defensive driving, to lessen the necessity for getting hurriedly out of traffic accident traps, and to use greater care for his passengers.

One method of driver education is practiced at St. Louis Public Service Company in connection with the use of the questionnaire I previously referred to. At the conclusion of the interview, the superintendent counsels with the transit operator as to the prevention of "On Board" falls, and uses our suggestions on the back of the

questionnaire form, as a check list of subjects to discuss.

In addition, we recently conducted a bean guessing contest at each division. A glass jar was filled with beans, equal in number to the passenger accidents at the division for one year, and the operator guessing closest to the correct number won $10.00. Another $10.00 was given to the operator with the closest estimate of the number of Type 63 accidents, which are passenger falls resulting from stopping. This contest produced about 75 per cent participation, and created a lot of interest (including side bets). When the winners were announced, a short safety talk was made on the passenger accident problem, and highlights of our study were discussed.

Mannequin Sells Safety

Just this week, we are trying another method, to dramatize the problem to the St. Louis Public Service Company operators. At the suggestion of Mr. O. W. Rexford, the Vice President and Operating Manager, we secured a mannequin and fixed her up to portray an elderly lady. With an electronic message repeater, we gave her a voice to help plead her case. One of her five messages goes like this:

"MR. OPERATOR, A GOOD *STEADY* DRIVER IS THE ONLY ASSURANCE OF SAFETY FOR AN *UNSTEADY* OLD LADY LIKE ME. I CAN'T CONTROL MY AGE, BUT YOU CAN CONTROL MOST SUDDEN STOPS BY DRIVING *DEFENSIVELY!*"

Here is another:

"ANY TIME I FALL ON YOUR BUS
IT'S USUALLY TROUBLE FOR BOTH OF US
SO FOR SMOOTH OPERATION, GIVE IT YOUR ALL
AND PREVENT US LADIES FROM HAVING A FALL!"

She is being exhibited at each division, with appropriate publicity and display cards. Appropriately, her name is "Ima Hazard."

During the past month, the acceleration rate on PCC streetcars has been adjusted and reduced to help check passenger accidents.

Scheduled within a month, will be a series of "5th wheel" stop meter braking demonstrations, plus visits by the Safe-T-Coach in connection with a "Safety Clinic" campaign. Smooth operation to prevent "On Board" falls will be stressed.

Supervisory personnel are being instructed as to the problem, and greater emphasis on more intensified "Safety Supervision" of road operation is underway.

In summary, may I again reemphasize certain salient points about "On Board" accidents, as ascertained by our surveys and experience:

1. Most falls are caused by averted traffic accidents.

2. Over half were standing prior to their fall, and ⅔ were not holding to a support even though a support was available in many instances.

3. Only three per cent used the overhead grab rod. Thus, a support must be convenient and comfortable to use (particularly for ladies).

4. Most falls involve women.

5. Sixty per cent of falls involve persons over 50 years old.

6. "On Board" accidents occur in all areas of the transit vehicle, but the area to the rear of the fare box produces the greatest number *of claims,* even though the greatest *number of accidents* are in area extending from approximately six feet behind the operator to the center exit door.

Improved Questionnaires Needed

In closing, if you make use of our data, develop an improved questionnaire, or initiate an "On Board" accident control program, I would appreciate exchanging information with you. I know that some properties have already done some good work in this field—but more is needed.

The following information is based upon a preliminary summary of these questionnaires and management believes that the operator supplying information for this particular report should be advised of certain facts to assist him in preventing any future "On Board" passenger falls.

We advise that your closing comment include the following: *(Indicate your check mark adjacent to each item).*

1. Operators claim a high percentage of "On Board" passenger falls occur because he was avoiding a traffic accident—and in some cases was surprised by a change in traffic light.

   a. Drive defensively and anticipate accident traps which necessitate sudden brake application.

   b. If a traffic problem requires a sudden brake application, or swerve, call out a warning, such as "Hold fast," "Hold on," etc. A warning may save a fall or bump.

2. Passengers most apt to fall are women, usually over 50 years of age.

   a. Operator should use extra care with *any* infirm or elderly passenger.

3. Preliminary study shows that passenger on board accidents do not occur in any selected portion of the vehicle.

   a. Rough operation is to be avoided *at all* times.

ON BOARD ACCIDENT TYPES

Type 62—Falls, bumps, etc.—bus/car starting.

Type 63—Falls, bumps, etc.—bus/car stopping.

Type 64—Falls, bumps, etc.—bus/car turning at curves or corners.

Type 65—Falls, bumps, etc.—bus/car running straight.

Type 69—On board accidents not otherwise classified.

St. Louis Public Service Co.
Special Survey
of
On Board Passenger Accidents
(Types 62, 63, 64, 65, 69, Description on reverse side)

Instructions:

Every operator who submits an accident report involving an "On Board" passenger accident will be interrogated by the Division Superintendent, or someone he designates, and the questions listed below will be answered.

This completed form will be attached to the copy of the accident report which is routed to the Transportation Department office, and then to the Safety Engineering Department of Transit Casualty Company.

Ask the operator to answer *each* as best he can. Reply to *every* question in some manner.

1. Were you avoiding a traffic accident. Yes__ No__
   a. If "yes," what happened? _____
   _____
   _____
   b. Was your abrupt stop caused by change of traffic light? Yes__ No__
2. Prior to accident, passenger involved was; sitting?____ standing?____ walking?____ unknown____. If walking; to rear____, to front____, changing seats____.
3. To your knowledge, was passenger holding to any stanchion or support prior to the incident? Yes__ No__ Unknown____
4. Was a stanchion or support within reach of the passenger? Yes__ No__
5. Specify support; stanchion____; seat handle____; overhead rod____; strap____; other_____
6. Did passenger fall to floor? Yes__ No__
7. Man____Woman____Child____ Approx. age_____
8. Was passenger carrying anything? No__ Yes__ If "yes," in what hand?_____
9. Indicate location of the passenger by putting an "**X**" on general diagram below.
   NOTE: This diagram is not to scale; it only reflects general areas.

Date of this report _____This report prepared by_____
_____Division Re: Acc. report No._____ Acc. type No._____

NOTE: *Use data on reverse side to conclude interview.*

Special Safety Survey

of

"On Board" Passenger Accidents

(Do not use for Boarding, Alighting, or Door Accidents)

To: *Adjusters*
(Transit Casualty Co.)

Note: *The purpose of this questionnaire is to help prevent future similar occurrences.*

The following information is to be collected by the adjuster when interviewing a passenger involved in an "On Board" accident, and will be completed after securing formal statement, etc.

1. At time of the accident was bus_____ streetcar_____ (check whichever applies) stopping?_____ starting?_____ running straight?_____ turning?_____.

2. At time of the accident, passenger was; sitting?_____ standing?_____ walking?_____. If walking; to rear_____, to front_____, changing seats_____.

3. Was passenger holding to any stanchion or support at the time of the accident? Yes___ No___. If "yes," specify support, stanchion_____, seat handle_____, overhead rod_____, other_____.

4. Was stanchion or support within easy reach of passenger? Yes___ No___

5. Specify support easily available (If "yes" to No. 4); stanchion_____, seat handle_____, overhead rod_____, other _____.

6. Did passenger fall to floor? Yes___ No___

7. Man_____Woman_____Child_____; Approximate age_____.

8. Was passenger carrying anything? Yes___ No___; If yes, what?_____

9. Please indicate location of the passenger at time of accident by putting an "X" on the general diagram below. *NOTE:* the diagram is not to scale but denotes only general areas.

Above data refers to Accident Report #_____; Claim #_____
This data collected by _____ on _____, 19_____

CONSOLIDATED REPORT ON

TRAFFIC SAFETY RESEARCH

(Revised)

Prepared for the Public Officials Traffic Safety Conference

THE PRESIDENT'S COMMITTEE FOR TRAFFIC SAFETY

Washington, D. C., December 9-10, 1957

Coordinator: Charles W. Prisk

Secretary: Leon Brody

Summary

This presentation is intended to be a more or less objective consolidation of reports on traffic safety research, specifically prepared for this conference by the following organizations: The Governors' Conference; a special group of federal agencies; The American Association of Motor Vehicle Administrators; the Institute of Traffic Engineers; the International Association of Chiefs of Police (Traffic Division); the International City Managers' Association (Conference Committee on Traffic Safety); The National Commission on Safety Education, National Education Association; and the American Public Works Association.

Five themes recur throughout these reports:

1. **Much more research needs to be done than is now being done.**
2. **There is a dearth of *basic* research.**
3. **Present funds for research are entirely inadequate.**
4. **Public support in this area is remarkably weak.**
5. **There is a great need for making research findings available, in intelligible form, to the public and to private groups concerned with safety measures; in other words, to the *users* of research.**

The General Problem

The report of the Institute of Traffic Engineers points out that: "The engineer is basically research-minded. He is constantly in search of facts, and is frequently unhappy that in so many instances he does not have the facts on which to base decisions."

Undoubtedly this is a commendable scientific attitude and it is an attitude that is undoubtedly true of enforcement personnel, educators, and other groups represented in this Conference, even though not stated in so many words in the reports submitted by these groups. Thus, in the report of the International Association of Chiefs of Police, it is noted that the police administrator, who has more and more applied scientific techniques in the field of crime, finds that in the traffic problem "he is operating in an area of opinion untested by research."

An indication of the basic problem is contained in a statement in the report prepared by the Governors' Conference: "From a long-range point of view, there seems to be no doubt that it is the 'nut behind the wheel' who is responsible for most accidents. Despite the very fine studies of driver behavior now being carried on, the area of why accidents occur will remain cloudy until we devote more time, energy and money to further research into the human factors."

Time and again reference is made in the various reports to the fundamental need for research dealing with basic accident causes; research that inquires into human and environmental factors and their inter-relationship in the causation of accidents—in other words, to use a phrase that is increasingly popular today, *basic research*. It is encouraging to note that groups with relatively specialized interests attach high priority to such research even though it transcends their immediate specialty. Thus, educators see research in their field as a part of traffic safety research generally. Moreover, the report of the National Commission on Safety Education emphasizes that in the educational phases of traffic safety research, assistance is needed from many allied scientists including psychologists, sociologists, statisticians, and others whose backgrounds have a bearing on the inter-relationships of vehicle, driver, and

environment. Undoubtedly, this interdisciplinary approach would be of value in attacking many of the problems that are encountered by other groups concerned with traffic safety research.

Typical Research Activities and Needs

The interest of federal agencies in traffic safety research, as expressed in the report by a group of these agencies, is indeed direct, broad, and varied. It is particularly noteworthy, therefore, that the Highway Safety Study being conducted by the Bureau of Public Roads is currently investigating many facets of the highway safety field "to determine what federal action can be taken to better this phase of the public welfare." This entails an analysis of what is going on or needed.

It is impossible, of course, to itemize *all* of the specific research needs and activities noted by the agencies whose reports we have attempted to consolidate. Still, it should be of interest to mention some of these as an indication of the scope and complexity of the problem. It should be emphasized that they are listed more or less at random. We have scrupulously avoided classifying them under the usual headings of Engineering, Enforcement, Education, etc., for fear that our selection of sample items from the reports might give the impression that there is greater need for activity in one area than in another. As a matter of fact, it is increasingly recognized that the three E's and the other areas are *not* mutually exclusive when it comes to research or, indeed, other action for greater traffic safety. This certainly is implied, if not expressly stated, in the research reports of the various organizations mentioned and even in the major reports on education, engineering, vehicle design, enforcement, laws and ordinances, motor vehicle administration, accident records, public information, coordination and cooperation. Here, then, are some of the going or needed researches:

How effective are point systems employed by motor vehicle departments for the control of drivers and how may these systems be improved?

How may the intial examination for the driver's license be improved? What should be the program of periodic re-examination?

What are the effects of various physical and mental conditions on driving ability?

What additional information is needed on the relationships between vehicle design factors, accident occurrence, and extent of resulting injuries?

How is accident occurrence affected by lane width, shoulder type and width, and other factors of roadway design?

How much traffic law enforcement is required to produce maximum feasible accident reduction?

What affect does patrol, as distinguished from citation and arrest, have on driver behavior?

What improvements are needed for greater effectiveness of such traffic control devices as signs, signals and pavement edge lines?

How can improved geometric highway design contribute to greater safety?

How may night visibility be improved?

Why do "average" drivers have accidents? (A particularly important question in view of the fact that most accidents involve such drivers.)

What do we need to know about driver attitudes, risk-taking behavior, and basic personality structures?

How can driver perception be improved?

How do various drugs affect driving performance?

How can we evaluate the effectiveness of safety programs and safety drives?

What further research is needed regarding highway surfaces as a factor in highway safety?

Why do drivers violate traffic laws and what bearing does this have on accident involvement?

How may chemical tests for intoxication be improved?

What is the accident reduction value of driver education?

How may teaching procedures in driver education be made more effective?

What are the specific transfer values of simulator trainers in driver education?

What operational problems arise on newly constructed, controlled-access highways?

What are the strengths and weaknesses in special forms of state aid for driver education?

How can traffic safety education be effectively incorporated in the curriculum of the primary school grades?

Through what methods can we affect a greater degree of carry-over of school-learned lessons into daily living?

How can desirable attitudes for traffic safety be developed?

How can we improve the program of driver clinics for rehabilitating chronic violators and accident-repeaters? What services can the courts render toward this objective?

What improvements in vehicle design can be made to increase the driver's range of vision?

How can vehicle deceleration be improved?

What are the factors in driver fatigue and how can these be best controlled, considering vehicle and roadway design as well as driver characteristics?

What is a proper re-education program for traffic court schools?

What are the relative merits of the various corrective measures available to the courts?

Under what conditions is a psychiatric approach to chronic traffic violators to be recommended?

What are the true relationships between speed and accident causation?

What is the effect of speed zones on traffic performance in general and accident occurrence in particular?

What improvement can be made in the markings on our streets and highways?

What evidence is there of accident reduction resulting from adoption of various sections of the Uniform Code? What improvements are indicated?

What do we need to know about driver-attitudes and basic personality structures as related to risk-taking behavior?

What is the psychology of pedestrian behavior resulting in accidents to pedestrians?

To what extent do the learnings in driver education persist?

Why are adults reluctant to participate in driver education and how may participation be encouraged?

How do the learnings of students taking a required course in driver education compare with the learnings of students who take such a course voluntarily?

What are the casual factors in accidents and violations involving graduates of driver education courses?

What tests and techniques can be used to screen out individuals who are potential accident risks?

If there is any one item or area, apart from the human element, which may merit more than listing, it is the need for improved accident investigation and reporting. As is pointed out in a report on accident records prepared by the National Association of State Safety Coordinators:

> "Ultimately, the success or failure of coordination in the official highway safety program of a state, county or municipality will be measured by the yardstick of the number of traffic accidents, the number of resulting deaths and injuries and the extent of property damage. Consequently, any deficiencies in accident recording serve only to distort the true traffic accident prevention picture."

The fact that accident reduction is the ultimate criterion of the effectiveness of any safety program, whether it be a program of education, engineering or enforcement. Without valid and reliable accident data, and adequate coverage of accident occurrences, it becomes extremely difficult to identify problems and weaknesses in our safety programs and therefore to undertake remedial measures. Present accident investigation and reporting generally provide considerable information on the "who," "when" and "where" of accidents but little on the "why" or "how" of such occurrences. Increasing attention is now being directed to improvement of this shortcoming but it still remains a primary area for research.

Finally there are two special needs that require consideration in the design and conduct of research programs dealing with problems such as those listed above.

One of these needs relates to some kind of *priority system* which will suggest first things first to interested researchers. The second need pertains to *coordination*—that is to say, an arrangement whereby research activities will not only not duplicate each other, but will actually complement each other in the over-all attack. A clearing house of research information and a central advisory agency are directly suggested by the latter need.

Some Administrative Considerations

The need for more research funds has already been indicated. According to the report of the American Association of Motor Vehicle Administrators, traffic safety research is "a proper area for more grants from the various private foundations and, if necessary, from the Federal government." The American Public Works Association has adopted a resolution "That additional funds be made available for accelerated research into the basic causes of traffic accidents."

In addition, of course, to appropriations needed for expanded research, the Governors' Conference report points out that appropriations must be made for "effectuating the programs or changes in programs, suggested by research findings." This effectuation of research findings is obviously a vital need in every area of activity and at every level.

As is noted in the report of the International City Managers' Association, there is an additional dimension to the problem. This has to do with relative costs. Researches with positive outcomes must be re-examined so that resultant programs will eventually provide "maximum benefit to the majority at the lowest possible cost."

An administrative matter of another kind is noted by the City Managers' group: "Local officials are so close to the major operational problems that time and manpower cannot be justified for research problems. Between routine duties and daily crises, studies and analyses are apt to be sidetracked." Parenthetically, we might add that this may often be the case on other public levels and in private areas.

On a positive side, the Governors' Conference has reported that "Present state agencies, including public health departments, working together have a unique opportunity to provide more meaningful accident information." Furthermore, it was suggested that the states would want to "work closely with other groups identified with traffic safety research." *Coordination and cooperation hold much promise for work in many areas of our problem.* They may indeed be essential to the over-all solution.

Role of the Public

Time and again the various reports refer to the public in a key sense in connection with traffic safety research activities and needs. It seems possible to categorize the suggested relationship of the public under the following headings:

1. ***Information.*** The public needs to be informed of research findings that affect their welfare on our streets and highways.
2. ***Acceptance.*** The public needs to be "sold" on the significance of safety research.
3. ***Active Interest.*** The public needs to be informed and "sold" in such a way that they will assume an active interest in the solution of the accident problem. Here we are getting into the area of public support as such. As is pointed out in one report, "Research into the causes of accidents is a dull subject in the mind of the public." It would seem, therefore, that one of our research needs is to find out *how* to spark real active interest in this matter in the mind of the public.

Finally, according to the report of the federal agencies, "public insistence on better control of automobiles and drivers" will help to "spur additional basic research on the part of responsible state and federal agencies." This should also serve organizations other than public agencies, such as universities and research organizations, which are now making important contributions to the cause of traffic safety.

WAYS AND MEANS OF FORECASTING ACCIDENT TRENDS AND THEIR USE IN TRAFFIC IMPROVEMENT*

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Synopsis

THE traffic death rates per 100 million miles vehicular travel as used in this study are those published by the National Safety Council for the years 1935 to 1954, inclusive. A wide range in rates prevails yearly, as well as from year to year, for the individual states during this time.

By taking account of such trends for individual states, for groups of states, or for the country as a whole, it should be possible to evaluate the results of different types of road building programs, of enforcement policies, of educational efforts and other variables. This paper is presented as a pilot study in the area of accident-trend analysis.

Iowa and the total U. S. rates were chosen as those to be extra-polated for ten years hence. Linear, logarithmic and reciprocal time series trends were calculated for each of the two areas of study.

In the calculations of the linear regression trend extrapolations, a zero value is reached during the year 1978 for Iowa. Since the linear regression trend for the total U. S. rate is much steeper a zero value is reached in 1968, much earlier. This seems hardly tenable hence other assumptions were used for reasons stated.

The equation of a straight line admits of no irreducible minimum. To avoid such an assumption, a logarithmic curvilinear relationship was considered whereby an irreducible was determined. The method of arriving at this value was by using one-half of the average traffic death rate for the last ten years recorded. The value for Iowa was 3.2. This rate value was then held constant for the calculation of a logarithmic trend for the full period under study.

The irreducible minimum calculated by this method for the total U. S. gave a much higher figure. The resultant value being 4.1.

It is thought that the prognostication of traffic death rates should not exceed a period of more than ten years for practical purposes. If at that time, or at an intervening year, should unforseen events such as a war or economic recession cause drastic fluctuations, a recalculation should be made prior to the expiration of the original decade considered. It is possible that calculations on the basis of five-year intervals would be more satisfactory. Such remains to be determined upon further evaluation and experimentation.

A reciprocal trend line was developed by the method of least squares for the same two groups. It was not necessary in this type of trend to assume any irreducible minimum. It was necessary to use the reciprocal of some year as a basis of calculation. Therefore the rate for the year 1920 was arbitrarily used as the base. A decade of extrapolation was calculated as had been done in the two previous methods. Here again it is possible that a shorter period of extrapolation may prove to be of greater value.

The use of one or more of these or similar techniques of evaluating traffic death rate trends might well be used by enforcement agencies, transportation or insurance companies, and highway engineers in further appraising phases of their respective programs.

*This study was made possible by a grant from the Allstate Insurance Company to Iowa State College for driving research. Paper given before the 36th annual meeting of the Highway Research Board on Wednesday, January 9, 1957.

Introduction

Traffic accidents were responsible for 40 per cent of all accident fatalities and 14 per cent of all accident injuries in the U. S. during 1954,[3] ranking fourth as the highest cause of death. An accident on the highway generally can be considered as an actual failure on the part of the road user, the vehicle, or the facilities concerned, in properly discharging their allotted functions in traffic movement.[2] A study of the facts surrounding traffic accidents is of vital concern to all those interested with the explicit purpose of reducing resulting fatalities and injuries to a minimum. So far only limited use has been made of the accumulated data on accidents to evaluate the various aspects of traffic control. It is the intent of the authors to suggest certain procedures whereby accident files may become more useful in this respect. Swanson[9] has made some explorations in this field.

The foundation of any safety program must be based on accurate reports and records that may be used as a basis for analysis in the prevention of traffic failures in the future. Such data should serve as a guide in a program of accident prevention for the many phases of traffic control improvement if properly analyzed and used. No clear-cut methodology has so far been developed.

Data on annual fatality rates per 100 million vehicle miles were obtained from several states, along with the total U. S. rate, for the period 1935 to 1954. The range in traffic death rates per 100 million miles vehicular travel in various geographical areas of the United States is great.

In the period of study ending in 1954 nearly 672,000 deaths and 23,500,000 nonfatal injuries have occurred in the nation as the result of motor vehicle accidents.[4] Although the traffic death rates per 100 million vehicle miles of travel are decreasing, the absolute number of deaths and nonfatal injuries are on the increase, as would be expected from the number of licensed drivers, the number of vehicles registered, and the average annual mileage driven by individual drivers. These combine to give more vehicular miles being driven in greater traffic densities and at higher speeds.

During the year 1954, 36,000 fatalities and 1,250,000 nonfatal injuries with property damage of 1.6 billion dollars were recorded for the total U. S. Considering rates only, the first year of this study, 1935, was the peak year for the two decades with 15.9 fatalities per 100 million miles of vehicular travel. For the remaining period under consideration, deaths per vehicular miles of travel have been steadily decreasing when a low traffic death rate of 6.4 fatalities per 100 million miles was reached in 1954. However, the absolute number of persons killed had reached a high of almost 40,000 in 1941, with 1.4 million nonfatal injuries.[5] It would seem that these data should be useful in evaluating the effectiveness of controls.

By determining trends, establishing the equations for best fitting curves and extrapolating such curves into the future the expected number of fatalities can be predicted. If the method used fails to show the expected results this might indicate a need for a change in the type of approach to the problem at hand.

Various factors need to be taken into consideration. With a growing population and an increase in vehicle registration as well as usage, trends can be better evaluated by comparison when all factors are considered. The relationship of traffic deaths to vehicular miles travel during a given year seems to be the most widely accepted method of comparison. This is largely due to the greater validity of this index. The usage takes into consideration vehicle registrations and the mileage driven. Various factors such as traffic density, population density, types of surfacing, enforcement policies, educational development and others must be considered.

Trends and their extrapolations here being considered are based on deaths per 100 million vehicular miles travel. However, the same techniques could be employed using the several other statistical data presently available.

Method of Procedure

The method suggested consists of the collection of available accident and traffic data throughout the United States, organizing it into a systematic relationship; selecting the best fitting mathematical parameters and curves and extrapolating these into a future period.

The trend curves used for illustrative purposes are based on traffic death rates for the 20-year period beginning in 1935 and ending in 1954. Extrapolations have been made to the year 1970. The calendar year beginning January 1 and ending December 31 has been used in calculations. Thus, the study includes data for the period starting January 1, 1935 and terminating December 31, 1954 with extrapolation to December 31, 1970. The rationale assumes a gradual evolutionary process of accident prevention development as well as the introduction of added hazards during the next ten years as has been expressed during the past 20 years.

Source of Data

The statistical data on the traffic death rate per 100 million miles vehicular travel were secured from the National Safety Council[6] for the period 1935 to 1954 as stated. The data as published listed individually the total number of traffic fatalities and the vehicular mileage traffic death rate for the total U. S., for each state, and for the District of Columbia. A special study of data for Iowa in comparison with the U. S. only will also be presented as an example of extension of the method to smaller geographical areas. The methods of trend extrapolations hereinafter described could be applied to any of the various states with the data presently available. Patrol districts or sub-divisions of a state could be similarily studied to ascertain their relative standing and progress. Too often accident files are kept and no practical use made of the data collected.

Hence, the purpose of this study is to suggest ways in which the extrapolation of such trends may be used as a measuring rod to determine the effectiveness of any given program or programs designed to reduce traffic accidents. Not only sample, best-fitting trend curves are presented for the nation as a whole but an index is also suggested for

use in evaluating trends of accidents in any state or geographical sub-division where data are available.

Analysis of Trends

The usual methods of trend analysis have been employed. Secular trend extrapolations have been determined by the method of least squares. The first attempt was made by assuming a linear trend. This leads to a fallacy of complete elimination of accidents about 1978 which does not seem reasonable. The assumption of a logarithmic, curvilinear type of regression relationship was also tried since extrapolations were desired, and from logical considerations the trend cannot be less than some irreducible minimum. This was arbitrarily assumed to be ½ of the average death rate index for the past 10 years. A reciprocal trend curve was calculated whereby it was unnecessary to assume such a minimum. The three types of time series trends were computed for the U. S. or Iowa from the data available as stated.

Trend in Rates Tabulated

The fatality rates for Iowa, Connecticut, Michigan, Rhode Island, Nevada, Washington and the total U. S. are given in Table 1. Although the fatality rates per 100 million miles vehicular travel are included for the six states listed in Table 1, trend analyses will be computed only for Iowa and for the total U. S. rates.

Table 1

FATALITY TRENDS OF TYPICAL STATES

No. of deaths per 100 million motor vehicle miles

Year	U.S. Avg.	Conn.	Iowa	Mich.	Nevada	R.I.	Wash.
1935	15.9	14.1	11.5	16.7	26.0	6.6	17.7
1936	15.1	10.8	9.1	15.5	16.6	7.0	15.4
1937	14.7	9.7	9.5	15.9	13.9	7.0	12.5
1938	12.0	7.8	7.8	11.3	13.9	4.5	11.0
1939	11.3	7.6	8.1	11.2	14.5	3.8	9.9
1940	11.4	6.7	8.0	11.4	14.5	4.4	10.4
1941	12.0	7.5	8.2	12.5	16.9	4.6	12.0
1942	10.6	7.1	6.6	9.5	19.0	4.8	9.3
1943	11.5	8.0	6.4	9.4	16.0	5.9	9.8
1944	11.5	7.4	6.6	9.7	9.4	5.9	10.3
1945	11.3	7.1	6.5	9.7	15.0	6.6	12.6
1946	9.8	5.0	7.2	9.1	13.5	4.8	9.2
1947	8.8	4.4	7.3	8.2	11.9	4.8	7.6
1948	8.1	4.6	6.9	7.9	11.9	2.9	6.9
1949	7.5	3.4	6.4	7.2	9.8	3.0	5.8
1950	7.6	4.1	6.2	7.5	12.0	3.9	6.3
1951	7.5	4.0	6.2	7.2	12.1	3.0	6.3
1952	7.4	3.3	5.3	7.5	12.0	3.1	6.4
1953	7.1	3.7	5.8	7.5	10.6	2.9	5.2
1954	6.4	3.1	5.9	6.9	10.2	2.4	4.4

Linear trends—

Any number of possible functions could be explored with respect to over-all trends in traffic death rates per 100 million miles vehicular travel. The first to be suggested is that any rate changes that take place constitute a linear function of time, i.e.

$$y = ax + k$$

where y = traffic death rate per 100 million vehicles miles travel and, x = twice the years removed from series middle 1944-1945 and, a and k = constants.

Upon substitution of the traffic death rate data for Iowa, based on vehicular travel in miles, the equation for projecting the above rate became

$$y = 7.275 - 0.1071x$$

A traffic death rate of zero is inconceivable. With the foregoing equation the year in which a zero rate would be shown may be found by substituting zero for y and solving for x. Thus,

$$0 = 7.275 - 0.1071x$$

Solving $x = 67.92$

Since x equals twice the number of years before and after mid-year 1944-1945, the year 1978 would be the first year in which the traffic death rate would reach a zero which is not likely.

Substituting the traffic death rate data for the total U. S., again on a vehicular mileage basis, the equation for extrapolating the linear trend becomes

$$y = 10.375 - 0.2221x$$

Since the trend for the total U. S. rate is much steeper, a zero value will be reached for this trend analysis much sooner than for Iowa.

Solving the equation to determine the year at which a zero value will be suggested may again be found by substituting zero for y and solving for x. Thus,

$$0 = 10.375 - 0.221x$$

Solving $x = 46.61$

As x equals twice the number of years before and after midyear 1944-45, the year 1968 would be the first year in which this type traffic death rate would be considered to reach a zero value for the total U. S. In either case the assumption of a linear function is not reasonable and further explorations as described below were made.

Logarithmic trend calculations—

From a rational point of view it was thought advisable to try some kind of curvilinear relationship which takes into consideration some irreducible minimum.

To determine specifically such an irreducible minimum must necessarily be somewhat arbitrary. For purposes of this study, one-half of the 10-year average traffic death rate on a 100 million mile vehicular travel basis for the years 1945 to 1954, was selected. For Iowa this value was 3.2 and for the total U. S., 4.1. Thus a trend equation

asymtotic to 3.2 was used in computations concerned with Iowa of the type

$$\log (x-3.2) = ax + k$$

where y = rate
x = twice the years removed from series middle 1944-45, and
a and k = constants.

When the traffic death rate data as aforementioned for Iowa was substituted in the foregoing equations, values of *a* and *k* produced the trend equation

$$\log (y - 3.2) = 0.58574 - 0.1080x$$

Upon the substitution of the irreducible minimum derived above for the total U. S. traffic death rate values of the constants evolved the normal trend equation

$$\log (y - 4.1) = 0.75488 - 0.01449x$$

This again is not entirely satisfactory as certain highways do have traffic rates below the figure at present.

Reciprocal trend calculations—

Reciprocal regression is a special form of the type of analysis indicated; for if the exponent equals one, changes in y_1 are related reciprocally to changes in y_2.

The normal equation by the rceiprocal method of least squares has been selected of the type

$$y = \frac{a}{x} + k$$

where y_1 = year within the series
y_2 = traffic death rate per 100 million miles vehicular travel and
x = twice the years removed from the series middle 1944-45, and
a and k = constants

A special table has been prepared taking into consideration the number of vehicles and the average mileage estimates.[1] (See Table 2)

Other possibilities—

Since each of these possibilities seems somewhat lacking, the equation of a best-fitting curve might better be used. The explorations made here are only suggestive of methods which could be used for evaluation of traffic control measures and policies.

By extrapolating the resultant curve for a 5 to ten-year period in the future a reasonable goal could be established against which to compare actual trends with a given speed law, enforcement policy, set of road conditions or educational policy. Statistical methods are available for testing the significance of difference found at any given time or period. The same type of evaluation could be applied to sectional changes due to any type of treatment imposed and desired to be evaluation.

Summary and Conclusions

A method is proposed whereby accumulated accident data may be assembled to be of value in essaying any set of conditions or program designed to reduce traffic accidents. The present paper is to be considered as exploratory in this field and many improvements and refinements are sure to be made. One application was made by Swanson[8] in which the relative merits of various speed law types have been compared.

Table 2

ABSOLUTE NUMBER OF TRAFFIC DEATHS BASED ON EXTRAPOLATION TRENDS OF NUMBER OF VEHICLES, AVERAGE MILES PER VEHICLE AND THE RECIPROCAL RATE*

Year	No. of Vehicles[1] (Millions)	Av. Miles per Vehicle (thousands)	Reciprocal Trend Rate per 100 Million Vehicle Miles Travel	Absolute No. of Fatalities (thousands)
1956	64	10	6.68	41.416
1957	66	10	6.49	42.834
1958	68	10	6.32	42.976
1959	70	10	6.16	43.120
1960	72	10	6.02	43.344
1961	74	10	5.89	43.438
1962	76	10	5.73	43.548
1963	78	10	5.61	43.758
1964	80	10	5.47	43.760
1965	82	10	5.37	43.870

*This assumes the same rate of development in traffic control measures, as well as that of increased hazards due to increased speeds, etc., as have been experienced during the past ten years. If either should tend to develop faster than expected the curve or trend would tend to deviate likewise. These calculations do not apply to limited-access highways where much better records have been established.

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AN EXPERIMENT IN REORIENTING DRIVER ATTITUDES IN TEEN-AGE DRIVERS

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THE purpose of the experiment was to develop a method of reorienting driver's attitudes among teen-age traffic violators.

The experimental group of traffic violators consisted of 74 males and one female, ranging in age from 15 to 18 years. Seventy completed the prescribed work. Classes were conducted over a period of several months, inasmuch as the maximum number of participants in any one class was 16, and classes had no more than seven or eight participants.

Candidates for the course were chosen by the probation officer on the basis of willingness to take the course and the intellectual capability of working in a group. The candidates who took the course either retained their drivers license or had it returned to them sooner than if they had gone through the usual process of discipline. It was believed that a large percentage of the candidates chose to take the course.

The attitude of the participants, as they were observed by the author, ranged from fair to very good—There were no recalcitrants.

The socio-economic status ranged from the sons of physicians and bankers to the sons of machinists and day laborers. Judged by the conduct and reactions of the participants in the group situation it appeared that intelligence ranged from low normal to very superior.

Although the classroom atmosphere was intended to be permissive and the leader attempted to subdue his own status as an adult, it should be evident that some rules of conduct had to be established. Two hour classes met at 7:30 in the evening once each week and a five-minute tolerance period was permitted before a tardy note was put into the participant's record. The only acceptable excuse for absence was a note from the participant's physician or permission from the probation officer. Absence was almost unheard of because it was found that teenagers were inordinately healthy and that the probation officer was extremely selective in accepting excuses.

A theme of not more than 300 words on some phase of the traffic problem was assigned for each class period. Class participants were asked to observe traffic violations once in each four-week period and to record the time, place, type of violation, and probable age of the violator, e.g., teener[1], young adult, adult, and report them to the class. This furnished a number of topics to discuss at the meetings.

GROUP DISCUSSION:

Group discussion was conducted with the author in the role of discussion leader. It was felt that this role called for introducing a subject and then guiding the discussion so that the interaction remained to the greatest possible degree within the group. Such subjects as speed, young peoples' attitudes on driving, and driver responsibility were typical subjects.

LECTURES:

Two lectures were given at the second session of the class. One lecture was on kinetics related to accidents—the other on alcohol and the driver. An honest attempt was made to deliver the lectures in an objective fashion and a distinct attempt was made to avoid "preaching."

THEMATIC APPERCEPTION:

The class was divided into small groups and pictures of local accidents were shown to them. They were given an opportunity to discuss each accident in terms of what happened leading up to it, what happened at the accident, and what happened following it.

Each group was then asked to express an opinion. Following the discussion, the leader told the group of the facts surrounding the accident. This seems to be the most popular method of presentation from the viewpoint of the participants.

INCOMPLETE SENTENCES:

A set of incomplete sentences was given to the participants and they were asked to complete them. Examples of these are given below:

1. **It seems to me that my biggest problem in driving is**
2. **I wish that the police**

[1]The author soon learned the vernacular of the teenager. It was found that one no longer, "Steps on the gas and makes the motor roar"; he now, "Barrels it and makes the pipes crack".

3. I think that drivers my age
4. Violating traffic regulations
5. My mother and dad think that my driving

ROLE PLAYING:

The class was divided into groups of three or four. Each group was asked to elect one of its members to enact the part of a policeman, another a judge, and the third a violator. The discussion leader then told the groups of a local accident in which the mother of a small boy was killed. The driver of one of the involved cars was speeding. The class was told that the policeman in their drama had just come from the scene of the above accident, and he had observed the violator going 40 mph in a 30 mph zone. The violator is placed under arrest and the play begins the next day in traffic court. The judge usually questions the policeman and then hears the violator's views. A sentence is passed that is usually more severe than one that would be pronounced in an adult traffic court. The participants in the drama are then asked to evaluate this sentence after which the rest of the class expresses its opinion. The most frequent consensus was that the sentence was just and fair.

MEASUREMENT:

The Siebrecht scale was used as an attitude measuring device. Participants were given the scale at the first meeting and again at the fourth meeting. The Chi-square method was used to determine significance of change. Seventy-five participants took the first scale and 70 took the second scale, or were re-examined. It was determined that there was change significant at one in one-hundred on 38 percent of the 40 statements in the scale.

Dr. Siebrecht has divided his scale into twelve categories or driver attitudes. Significant change was found in statements within nine of the twelve categories:

No. of questions within category	Categories	% of questions in which significant change was found
3	examination for drivers license	33
6	courtesy concern	33
4	violations	50
8	knowledge & skills	50
2	passing on hills & curves	50
5	condition of driver	40
2	enforcement of traffic regulations	50
2	responsibility	50
2	cooperation	50
2	driving as a privilege	00
2	speeding	00
2	condition of automobile	00

CONCLUSION:

If the Siebrecht scale is accepted as a reliable criterion then there is a change of attitude among the teen-age people who were exposed to the reorientation techniques.

Some reservation must be held about accepting the scale results because there may be a feeling on the part of the participant of wanting to please the adult leader. It is felt, however, that the scale should be continued to be used until a large sample can be obtained and a decidivism rate developed.

SUMMARY:

1. The smallness of the sample used makes questionable the drawing of valid conclusions.
2. The Siebrecht scale, while useful, should not be used as the only criterion.
3. It is felt that a recidivism rate will probably be the most reliable citerion.

This study has been reported primarily in the belief that it may stimulate other investigations of a similar sort in various places where the data could be collected with little more effort than is involved in keeping the necessary records on current programs. Prior to publication the article was submitted to an expert consultant in the traffic safety field[1] for an independent evaluation. His remarks follow:

"I am not exactly sure what the Siebrecht attitude scale measures and I rather feel, as you do in your conclusions, that it should not be used as the only criterion because, if a bright student leader or teacher wants, he can usually pick replies in the Siebrecht scale which will be acceptable. However, it does not follow that there has been any fundamental change in those activities and ideas which give him genuine satisfaction or which cause him distress and thereby constitute the foundation of his "attitude".

"I approve of your idea that the rate of repeating will be interesting. By itself, however, it may not be significant.

"For example, let us assume that, among people of the ages with which you are dealing, much of the attitude responsible for repeated accidents and violations is a function of maturity. Let us say that the natural processes of living in our society gradually cause the individual to adjust, adapt, or, we might say, mature in his environment. Then, at the beginning of the period in which he is experimenting with what he can get away with in his environment, his immaturity may cause him to have accidents and violate laws. But as he matures he changes and will, without "treatment," gradually move into the group of people who manage to get along with very few accidents and violations. Thus he would improve whether he was treated or not. If you will permit a vulgar comparison, this may be something like the skin acne of adolescence. At certain ages many young people find their faces erupting with ugly pimples. Generally a decade of development will find them free of this difficulty regardless of whether treatment has been given or not.

"Our problem, then, is to determine whether the treatment suppresses the behavior which is undesirable or accelerates passing through this stage of development.

"A showing that those who receive the special training were less likely to be repeaters might be only a showing that they were growing up. To demonstrate whether the treatment is effective, we would not only have to watch the results of those people treated, but also should establish a control group of people of the same ages who were permitted to continue driving without the treatment, and then compare the future experience of the two matched groups. Then, if the group who received the special attitude training showed fewer accidents or violations, we could evaluate the training. I believe that even with fairly small samples, the dividing of the people into two groups at once and watching their subsequent experience would be extremely worthwhile and very enlightening."

[1]J. Stannard Baker; Director, Research and Development; The Traffic Institute, Northwestern University; Evanston, Illinois.

DEVELOPMENT OF A CRITERION FOR DRIVING PERFORMANCE

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Introduction

DURING the several years that driving researches have been in progress, experimenters have felt the need for a sound criterion of driving ability. Different investigators have used various types of criteria. None have been found completely satisfactory.

The ordinary road test as a criterion has been found by Lauer and others[2] to have low reliability. Even those who originally developed this test have never published anything which indicates the statistical reliability of the test. Neither has anything been done to show its validity.

The Adjutant General's Office of the Army has done a great deal to develop various types of criteria for the Armed Forces. One of the studies which has been published describes a well-developed criterion of driving ability.[3] It is based on ratings by associates and superiors. While satisfactory for the purpose devised it would be rather impractical and difficult to administer under civilian conditions, due to the lack of a sufficient number of persons (familiar with the driver's performance at the wheel) who could rate the driver.

The criterion of reported accidents has been found quite unreliable. Even over successive periods, Johnson[1] found correlations as low as .30 for the same drivers in two successive epochs. Various explanations may be given. First, there is very little chance of being caught in a violation or accident; and second, there seems to be a psychological effect which follows being involved in an accident. The precise effect seems to be differential. For most drivers it has a deterrent effect. For a few persons it is indicative of future behavior with similar results. Intercorrelations of rating scales, as well as laboratory devices designed for measuring certain aspects of driver performance, were made. The hypothesis set up for testing may be stated as follows: patterns of behavior relating to good driving performance are measurable.

This study made possible through a grant for driving research from the American Automobile Association. Paper given before the 36th Annual Meeting of the Highway Research Board, January 9, 1957.

Method and Procedure

This is a four-phase study of driver performance designed to establish a basis or criterion of driving ability. Each subject was given a simulated driving test in the laboratory under controlled conditions. The second test was that of driving an instrumented car over an 8-mile standard route. A tachograph record was obtained for each subject while the trip was being made. The road driving performance was rated by means of the Roger-Lauer Scale using 349 subjects. They included commercial drivers, lay drivers, and students just completing a driver education course.

The Roger-Lauer Scale.

This is a paper and pencil rating scale first developed in 1938. It is divided into two parts. Each part is scored separately and the two combined for a total score.

Part one covers 12 behavior categories assumed to be largely inherent. There are five descriptive phrases in each category. The rater checks the phrase which he thinks most characteristic of the rates. Each phrase has a numerical weighting. The sum of the numerical weightings constitutes the score.

Part two is concerned with the degree of skill shown in performance of certain functions deemed basic to efficient automobile driving. It consists of 15 items which are rated on a seven-point scale. The sum of the scale point values constitutes the score.

This scale was originally reported to have a reliability of the order of .90. Split-half reliabilities were computed from the ratings made in this study. The resulting coefficients for part one, part two, and total score are shown in Table 1.

Table 1

RELIABILITY OF RATINGS ON ROGER-LAUER SCALE

	Students[a]		Experienced Drivers[b]		Total Group[c]	
	r_{12}	r_t	r_{12}	r_t	r_{12}	r_t
Part 1	.76	.86	.57	.73	—	—
Part 2	.76	.86	.72	.84	—	—
Total score	—	—	—	—	.85	.92

[a]Based on 231 cases
[b]Based on 118 cases
[c]Based on 349 cases
[d]Estimated full-length reliability using the Spearman-Brown formula.

Tachograph.

The Sangamo Model AA 12-hour Tachograph was used. In addition to containing a speedometer, odometer, and clock, this instrument makes a graphic recording of fluctuations in speed, total trip time, and miles traveled.

An analysis of each trip was made by means of the tachograph chart analyzer. Trip time, modal speed, maximum speed and number of fluctuations were determined.

The intercorrelations of the various factors measured by the tachograph together with their correlations with the Roger-Lauer Scale ratings are shown in Table 2.

Table 2

INTERCORRELATIONS OF TACHOGRAPH AND ROGER-LAUER SCALE DATA

	1	2	3	4	5
1. Trip time	———	—.6920	—.6590	.5640	—.2690
2. Modal speed		——	.8290	—.4970	.2000
3. Maximum speed			——	—.5050	.1350
4. Number of fluctuations				——	—.0003
5. Roger-Lauer Scale					——

A correlation of the Tachograph measurements with the Roger-Lauer Scale rating yielded a multiple R of .3375 which shrank to .3178 when corrected for the number of cases and number of variables.

On a rational basis from the magnitude of the betas it would seem that (1), (2), and (4) of this matrix should be considered in the final evaluation phase of this study.

A multiple correlation of .3375 was obtained between the four tachograph variables and the Roger-Lauer Scale rating. The shrunken R was .3178.

Auto Trainer.

This is a laboratory device developed by the American Automobile Association for purposes of driver instruction. Full-sized automobile controls are used to guide a miniature car around a traveling roadway simulating driving. It may also be used as a testing device.

The device is designed so as to yield several subscores. They are (1) steering efficiency or the ability to stay on the road, (2) response time to traffic lights as presented, (3) errors in manipulation or such failures as not following directions and road signs, (4) movements made in braking, shifting, etc., and (5) total time for the trip of a given number of revolutions of the roadway belt. All recordings are made automatically by a battery of electric counters.

The conditions were standard for all subjects. They included use of clutch, brake and accelerator, steering wheel, driving forward and backward, and parking. Observation of signs and other features of the device simulate actual road-driving conditions and are controlled to some extent.

Table 3 contains the test-retest reliability coefficients for the various scores on the Auto Trainer.

Table 3

RELIABILITY OF DIFFERENT SCORES ON THE AUTO TRAINER[a]

	r_{12}	r_t[b] on sum of test-restest scores
Steering (contacts)	.52	.68
Total time (minutes)	.75	.85
Response time (milliseconds)	.48	.66
Movements (total recorded)	.48	.66
Errors (practices violated and mistakes made)	.73	.84

[a]Based on 150 cases at Iowa State College
[b]Estimated reliability of a test-retest score using the Spearman-Brown formula—scores added together.

The intercorrelations of the Auto Trainer scores are listed in Table 4. Correlations with the Roger-Lauer Scale ratings are also included in this table.

Table 4

INTERCORRELATIONS OF AUTO TRAINER SCORES AND ROGER-LAUER SCALE RATING

	1	2	3	4	5	6	7
1. Steering	——	—.3120	.1050	—.2960	.1710	.2080	.1480
2. Errors		——	.2150	.1840	.1780	—.2270	—.2170
3. Movements			——	—.0090	.4350	—.1600	—.1360
4. Observation time				——	.0520	—.1140	—.0400
5. Total trip time					——	—.2540	—.3610
6. Hand brake pressure						——	.2660
7. Roger-Lauer Scale							——

A correlation of the Auto Trainer scores with the Roger-Lauer Scale rating yielded a multiple R of .4503 which shrank to .4289 when corrected for the number of cases and number of variables.

On a rational basis from the magnitude of the betas it would seem that (1), (2), (5), and (6) of this matrix should be considered in the final evaluation phase of this study.

The six Auto Trainer scores yielded a multiple correlation of .4503 with the Roger-Lauer Scale rating. The corrected R shrunk to .4289.

Car Instrumentation.

An Oldsmobile, hydramatic drive, four-door sedan equipped with instrumentation designed to measure driver performance objectively with respect to certain factors deemed relevant to efficient operation of a motor vehicle was used for the road tests.

On a panel just back of the dashboard at the right side the following instruments are mounted from left to right:

1. Revco reduction gear and counter. It is used to integrate the total amount of steering-wheel movement made by the driver. The counter is attached to the reduction gear so as to make a continuous recording of the steering wheel movements in both directions. The reset counter is set at zero at the beginning of each trip. At the end of the trip the numerical reading is recorded as steering-movement score.

2. Sangamo Model AA Tachograph previously described.

3. Trerice vacuum gauge. The gauge is attached to a pressure chamber which is set to activate a counter whenever the carburetor vacuum pressure is equal to the setting. In this way a recording of accelerator movements is obtained.

4. Gasoline meter. A McCulloch gasoline meter was used to measure gasoline consumption in 1/100ths of a gallon. The meter can be reset to begin accumulating from zero at the beginning of each trip.

5. Trerice hydraulic pressure gauge. Maximum pressure in pounds made on the brake pedal is measured and retained on this instrument by a special hand.

Other instruments are located in the rear seat area of the experimental car.

6. Accelerator movement counter. The counter is mounted on a panel built in front of the rear seat rest. It is connected to the vacuum gauge in such a way as to be activated every time the indicator hand of the gauge fluctuates above or below a preset reading.

7. Brake movement counter. This recording device is mounted just below the accelerator movement counter. It is connected to the stop light circuit so that it is activated every time the brake pedal is depressed thus recording brake applications.

8. Jerk recorded. The jerk recorder is housed in a steel cabinet measuring 4½" x 7½" x 5" high. A ½" steel shaft runs through the center of the cabinet near the top. Two pendulums each 4½"-long are mounted to swing freely on this shaft. On the center of the shaft between the two pendulums is an assembly consisting of two brass ratchets each with 60 teeth and a sprocket wheel with 20 teeth.

When a stop is made, one pendulum swings forward turning one of the ratchets by means of a small pawl. The sprocket wheel turns with the ratchet and operates a mechanical counter. Each 18 degrees of rotation of the pendulum counts one unit on the counter. A movement of six degrees causes the counter to record 1/3 unit. The other pendulum is arranged so that it moves when a sudden start is made and operates in a similar manner but with different settings for sensitivity.

Two of these instruments are used. One is placed lengthwise with the car so as to record sudden stops or quick starts. The other is placed crosswise of the car so as to measure sway from side to side. It is set to register slighter movements, that is made more sensitive. Both instruments are placed on the floorboard in front of the rear seat.

Split-half reliability of the data gathered by the various instruments in the experimental car is shown in Table 5.

Table 5

RELIABILITY OF EXPERIMENTAL CAR INSTRUMENT SCORES[a]

	r_{12}	r^b
Steering movements	.54	.70
Gasoline consumption	.62	.77
Accelerator movements	.70	.83
Brake movements	.42	.59
Brake pressure	.48	.65
Jerk recorder (lengthwise)	.70	.83
Jerk recorder (crosswise)	.56	.72

[a]Based on 349 cases

[b]Estimated full-length reliability using the Spearman-Brown formula.

Intercorrelation of the scores obtained from the experimental car instruments together with their correlations with the Roger-Lauer Scale rating are presented in Table 6.

Table 6

INTERCORRELATIONS OF EXPERIMENTAL CAR, INSTRUMENT SCORES AND ROGER-LAUER SCALE RATING

	1	2	3	4	5	6	7	8
1. Gasoline consumption	——	.3220	.1970	.0780	.1600	.0080	.0090	—.1030
2. Steering movements		——	.2630	.0710	.3870	.1050	.1730	—.5210
3. Brake pressure			——	.1490	.0780	.1220	.1620	—.1940
4. Brake movements				——	.2410	.1720	—.1220	.0510
5. Accelerator movements					——	.2240	.0690	—.2520
6. Jerk recorder (lengthwise)						——	.3760	—.2380
7. Jerk recorder (crosswise)							——	—.1760
8. Roger-Lauer Scale								——

A correlation of the Experimental Car instrument scores with the Roger-Lauer Scale rating yielded a multiple R of .5741 which shrank to .5603 when corrected for the number of cases and number of variables.

On a rational basis from the magnitude of the betas it would seem that (2), (4), and (6) of this matrix should be considered in the final examination phase of this study.

A multiple correlation of the instrument scores with the Roger-Lauer Scale rating was computed. R = .5741. This shrinks to .5603.

Discussion

This is the first part of an extended study which is being made in an effort to develop an objective criterion of driving performance. The purpose of this portion of the study was to determine the reliability and validity of the various objective separate measures and to select the ones which seem to be most worthy to be included in the second part of the study which is to be reported later.

The Roger-Lauer Scale ratings were used as the primary criterion against which to evaluate the potential predictive value of the several objective scores. This scale was selected because it has sufficient reliability for individual use and provides an immediate criterion. It also samples behavior patterns as well as developed skills.

Two of the Auto Trainer subscores, namely total time and errors, seemed to possess sufficient reliability and validity to be retained for further study. These two measures with hand brake pressure correlated the highest with the Roger-Lauer Scale rating. Reliability of hand brake pressure was not computed. It was used more as an auxiliary measure in this study. From previous studies it would appear that steering movements should be retained for further evaluation.

Three of the tachograph variables seemed promising. They are trip time, modal speed, and fluctuations in speed. Modal speed correlated considerably higher with the Roger-Lauer Scale rating than did maximum speed.

Most of the instruments in the experimental car seemed to measure with sufficient consistency to merit their retention in the second part of the study. Accelerator movements and smoothness as measured by the jerk recorder—measuring lengthwise thrust of the car—showed highest reliability.

The measurements from the four phases of the study showing satisfactory performance are to be combined into a multiple correlation with road-driving performance rating in the second part of this study. The factors making the most significant contribution to the multiple R are to be used in development of an objective criterion of driving performance ability. From the data available it would appear that with these techniques combined it may be possible to measure from 70-90 per cent of the variance in driving ability.

Conclusions

Considering the characteristics of the sample employed, number of subjects, and the nature of the results obtained, the following conclusions may be tentatively drawn from this study:

1. The Auto Trainer yields three subscores: Total time, errors, and steering, which are sufficiently substantial to justify their use in further research in driver evaluation studies.

2. Analysis of tachograph records will give valuable information on driving ability. Further study needs be made of possible derived scores.

3. The AAA Jerk Recorder will reliably measure smoothness of movement when placed lengthwise of the car.

4. The better performing driver holds the wheel steadier, i.e., turns the wheel less, uses less gasoline, works the accelerator less and is less severe on the brake than the poorer performing driver.

5. Certain factors related to road driving performance can be substantially measured by means of scores objectively obtained while the driver is performing the task. Supplementary measures made by simulated driving devices will increase the predictive value of a battery designed for this purpose.

6. The hypothesis set up for testing—that driving performance can be objectively measured—is affirmed within reasonable limits of error.

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TRAFFIC SAFETY RESEARCH PROJECTS

THE National Safety Council has knowledge of the following research projects. Some of these projects are still in the process of completion, some have been already completed, and some have been recently published.

Each project has been classified by a library classification number, used by the Bureau of Highway Traffic at the Yale University. Each number is a subdivision of a principal heading. The headings are as follows:

000 General
100 Road Users
200 Vehicles
300 Fixed Facilities
400 Traffic Characteristics and Controls
500 Law
600 Education
700 Administration
800 Economic and Sociological Aspects
900 Planning

The title is in quotes, and the name and address of the institution where the research is being done follows, with the name of the principal investigator. Short summaries are available on what the investigators are trying to do, but anyone wanting more than a summary of 100 or 200 words will have to correspond directly with the institute or individual doing the research.

All of this material will be abstracted and presented in the future in more detail than the list below provides. These abstracts will be published in subsequent editions of the RESEARCH REVIEW in the space now used for this listing. Any new reports of research will be immediately abstracted and presented in this journal in the earliest possible edition. In the March edition of each year a revised listing similar to the one below will be printed and will contain all additional research titles, etc., that have been received during the past year.

#100—"Study of Human Characteristics"—Department of Health, State of New York, Albany, N. Y.—Dr. Walter E. Boek and Dr. Jean Boek

#101—"Driving Attitude Study"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—Dr. Harry Case, Professor of Psychology and Engineering, Dr. Roger Stewart, assistant psychologist

#101—"Driving Experience and Opinion Survey"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—Dr. Roger Stewart, assistant psychologist, Dr. Harry Case, professor of Psychology and Engineering.

#101—"Regulation and Control of Problem Drivers"—Institute of Government, University of North Carolina, Chapel Hill, N. C.—Bobbie Campbell, chief investigator, University of North Carolina.

#101—"Revised Qualifying Percentile Rating—Over-the-Road Highway Drivers—Army General Classification Test—First Civilian Edition—Form AH"—Mid-State Freight Lines, Inc., 5200 So. Pulaski Rd., Chicago 32, Ill.—A. F. Mayerhofer, Mrs. Donna Frizelis, John Finitzo

#101—"Revised Qualifying Percentile Rating—Over-the-Road Highway Drivers—Bennett Mechanical Comprehension Test"—Mid-State Freight Lines, Inc., 5200 So. Pulaski Rd., Chicago 32, Ill.—A. F. Mayerhofer, Mrs. Donna Frizelis, John Finitzo, Safety Department

#101—"Attention Value of Warning Signals"—Washington University, St. Louis, Mo.—George L. Kreezer, professor of psychology, Department of Psychology, Laboratory of Engineering Psychology.

#110—(Driver Clinic)—Ontario Motor Vehicle Branch, Toronto, Ont., Canada—A. H. Rowan

#130—"A Study of the Effect of Dependency and Other Personality Characteristics on Airmen in a Familiar Crisis Situation"—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research, (Ph.D.) Philip L. Goldberg, psychologist, Mitchel Air Force Base, N. Y.

#130—"A Study of the Relationships Between Driving Records, Selected Personality Characteristics and Biographical Data of Traffic Offenders and Non-Offenders"—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research (Ph.D.) Earl D. Heath, instructor

#130—"Personality Differences and Similarities between Offender and Non-Offender Air Force Motor Vehicle Operators"—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research (Ph.D.) by Willis Hubert, Major, United States Air Force

#130—"A Study of the Unmet Emotional Needs of Ac-

cident-Repeating and Accident-Free School Children"—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research (Ph.D.) Grace Ellen Stiles, State Teachers College, Millersville, Pa.

#130—"Development of a Screening Inventory to Identify Unsafe Juvenile Drivers"—Michigan State University, East Lansing, Mich.—William A. Mann, Ed.D., Highway Traffic Safety Center

#130—"Survey of Personal and Interpersonal Factors in Driving"—University of Colorado, School of Medicine, Denver, Colo.—Herbert S. Gaskill, M.D., responsible investigator and director of Psychiatric Services

#130—"Search for Psychomotor Abberrations by EEG in Naval Aviation Applicants and Correlations with Training Experience and Fleet Performance—U. S. Naval School of Aviation Medicine, NAS, Pensacola, Fla.—Lt. R. E. Luehrs, MC, USN Professional Personnel, G. A. Ulett, M.D., Ph.D. Consultant

#130—"Study of Psychological Factors Related to Flight Safety in Naval Air Training"—U. S. Naval School of Aviation Medicine, Pensacola, Fla.—Lt. W. B. Nelson, MSC, USN. Wilse B. Webb, Ph.D.

#131—"Dynamic Visual Acuity of Drivers"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—Slade F. Hulbert, asst. research psychologist, Albert Burg, graduate research psychologist

#131—"Survey of Drivers Licensing Requirements," by American Optical Company—American Optical Co., Rochester, N. Y.—Perry A. Roberts, O.D.

#131—"Relation of Dynamic Visual Acuity to Driving Performance"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—Slade Hulbert, assistant research psychologist

#134—"Effect of Age on Ability to Adjust to Collision Courses"—Institute of Applied Experimental Psychology, Tufts University, Medford 55, Mass.—Joseph W. Wulfeck, Ph.D., principal investigator, director

#135—"Accident Proneness"—University of California, Berkeley, Calif.—Dr. Jerry Neyman, Department of Statistics-Statistical Laboratory

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#137—"Driver Obedience to Stop and Slow Signs"—Joint Highway Research Project, Purdue University, West Lafayette, Ind.—W. T. Jackman, research assistant, Joint Highway Research Project

#137—"Psychology Trip Geography"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—Slade F. Hulbert, assistant research psychologist

#137—"Unlocked Automobiles and a Study on Human Behavior"—National Automobile Theft Bureau, Western Division, 175 W. Jackson Blvd., Chicago 4, Ill.—William J. Davis, manager

#137—"Driver Speed Performance Related to the Facility"—Bureau of Highway Traffic—Yale University—Donald E. Cleveland, research associate, Bureau of Highway Traffic

#141—"The Drinking Driver and Accidents"—Department of California Highway Patrol, Research and Development Section, P. O. Box 898, Sacramento 4, Calif.—H. J. Newson, assistant statistician Research and Development Section

#141—"The Correlation Between the Degree of Intoxication and the Amount of Ethyl Alcohol in Various Body Fluids"—Wartburg College, Waverly, Iowa—Dr. A. W. Swensen, head, Physical Science Department

#141—"Introduction of Breath Testing Evidence to the Court"—Attorney-General's Laboratory, 67 College St., Toronto, Ont., Canada—H. Ward Smith, Ph.D., director Attorney-General's Laboratory

#150—"Human Engineering Assistance in Aviation Medical Safety Training"—U. S. Naval Training Device Center, Port Washington, Long Island, N. Y.—Alexander Goldman

#201—"Ridit Analysis of Automotive Crash Injuries"—Automotive Crash Injury Research, 316 East 61st Street, New York 21, New York—Irvin D. J. Bross, Ph.D., statistical consultant for Automotive Crash Injury Research, head of the Statistical Service Section of Cornell Univ. Med. College and Research, Rivkah Feldman, member of the Statistical Service Section of Cornell Univ. Medical College

#210—"Automobile Collision Research Program"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—J. H. Mathewson, assistant director, D. M. Severy, associate engineer (Project Engineer)

#210.1—"The Effect of Automobile Design Features on Accident Rates"—Dunlap and Associates, Inc., 429 Atlantic St., Stamford, Conn.—Jack Dunlap

#214—"Automobile Crash Injury Research"—Cornell University Medical College, 1300 York Ave., New York 21, N. Y.—John O. Moore, principal investigator

#214—"Automobile Crash Injury Research"—Cornell University Medical College, 1300 York Ave., New York 21, N. Y.—John O. Moore

#214.7—"Automotive Crash Injury Research"—Automotive Crash Injury Research, Department of Public Health and Preventive Medicine, Cornell University Medical College, 316 E. 61st St., New York 21, N. Y.—John O. Moore, director

#216—"Automobile Crash Injury Research"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—J. H. Mathewson, assistant director

#216—"Motor Vehicle Crash Injury Research"—Assistant for Ground Safety, AFPGS, Headquarters USAF,—Lt. Col. J. P. Stapp, chief, Aeromedical Field Laboratory, Holloman A.F.B., N. M.

#216—"A Preliminary Study of Speed in Injury Producing Auto Accidents"—Automotive Crash Injury Research, 316 East 61st Street, New York 21, New York—John O. Moore, director; Boris Tourin, chief, Technical Operations

#220—"Tank Truck Carrier Accidents"—National Tank Truck Carriers, Inc., 1424—16th St., N.W., Washington 6, D. C.—Louis Rezneh

#300—"Traffic Accident Analysis; Traffic Engineering Survey; Highway Design Survey"—Commissioner of Public Safety, City of White Plains, N. Y.—Frank T. Hanlon

#301—"Influence of a New Expressway on the Traffic Pattern on Existing Highways and the Area of this Influence"—Department of Public Works, Commonwealth of Massachusetts—Cooperative Project between the Massachusetts Institute of Technology, under Professor Alexander Bone, and the Department of Public Works of the Commonwealth, under the coordinator, Ralph P. Joslyn—A Thesis, no publication

#301—"State Highway Needs in Indiana"—Joint Highway Research Project, Purdue University, West Lafayette, Ind.—Harold L. Michael, assistant director, Joint Highway Research Project

#310.4—"Investigation of Flood Magnitude and Frequency on Small Areas in Ohio"—Ohio Department of Highways Cooperating with Water Resources Division, U. S. Geological Survey, 1509 Hess St., Columbus, Ohio—S. O. Linzell

#312.2—"The Relationship Between Accident Data and the Width of Gravel Shoulders in Oregon"—Oregon State Highway Department, Traffic Engineering Division—J. Al Head, assistant traffic engineer

#316.3—"Highway Sign Studies"—Virginia Council of Highway Investigations and Research, Thornton Hall, University of Virginia, Charlottesville, Va.—T. M. Allen

#317—"Skid Resistance of Highway Pavements"—Joint Highway Research Project, Purdue University, West Lafayette, Ind.—H. L. Michael, assistant director, Joint Highway Research Project

#317—"Slipperiness of Pavements"—Tennessee Highway Research Program, University of Tennessee, Knoxville, Tenn.—E. A. Whitehurst, director

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#400—"A Proposal for a Traffic Safety Research Program"—Rochester Institute of Technology, Rochester, N. Y.—Donald A. Hoppe, director, traffic Safety Research

#400—"Street and Traffic Management"—Automotive Safety Foundation, 200 Ring Building, Washington 6, D. C.—Norman Damon, Traffic Engineering Division and the Legal Division

#400—"Human Engineering"—American Institute for Research, 410 Amberson Ave., Pittsburgh 32, Pa.—Dr. T. W. Forbes, program director

#400—"Summary of Human Engineering Data Applicable to Highway Design and Traffic Engineering"—American Institute for Research—410 Amberson Avenue, Pittsburgh 32, Pa.—Dr. T. W. Forbes, program director, Highway and Safety Research, Milton S. Katz, project director

#401—"Stimulation of Traffic Flow"—Institute of Transportation and Traffic Engineering, University of California, Los Angeles 24, Calif.—J. H. Mathewson, assistant director, D. L. Gerlough, associate engineer

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#416.4—"Traffic Patterns on Speed-Change Lanes at Interchanges"—Department of Public Works, Commonwealth of Massachusetts—Cooperative Project between the Massachusetts Institute of Technology, under Professor Alexander Bone and the Department of Public Works of the Commonwealth, under the coordinator, Ralph P. Joslyn—(A Thesis, no publication)

#423—"One-Way Street Routings on State Highways in Oregon Cities"—Oregon State Highway Department, Traffic Engineering Division—F. B. Crandall, traffic engineer

#426—"Effect of Traffic Direction on Delays at Intersections"—Traffic Institute, Northwestern University, 1704 Judson Ave., Evanston, Ill.—J. Stannard Baker—(Discontinued, incomplete, no report)

#426—"Study of Traffic Movements at Rural Intersections"—University of Wisconsin, Madison, Wis.—Floyd F. Rader, professor of Civil Engineering

#432—"A Comparative Study of Traffic Movement on Simultaneous vs Triple Alternate Traffic Signal"—Department of Public Safety, Room 301 City Hall Annex, Richmond, Va.—Bureau of Traffic Engineering, H. K. Perkins, Jr.

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#470—"Boston Traffic Accident Survey"—Massachusetts Safety Council, 31 State St., Boston 9, Mass.—Bruce Campbell, manager

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#470.3—"Study of Pedestrian Facts in the State of California, 1949 through 1954"—The Department of California Highway Patrol, 2490 First Ave., Sacramento, Calif.—B. R. Caldwell, commissioner

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#471—"The Situational Pattern in Childhood Injury" II. Data Derived from Head Injuries Admitted to Duke Hospital—Duke Medical School, Durham, N. C.—Barnes Woodhall, M.D.

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#471.1—"Boston Street Accident Survey"—Massachusetts Safety Council, City of Boston, Boston, Mass.—William Arthur Reilly, traffic commissioner

#471.11—"Studies of Children Showing Injury Patterns"—Tulane University School of Medicine, 1430 Tulane Ave., New Orleans 12, La.—Irwin M. Marcus, M.D., associate professor of Psychiatry

#471.11—"A Study of School Bus Accidents in Kansas and Their Probable Causes, in Which Injuries Have Resulted" (1953-55) Masters Degree Thesis—Lloyd Lesley, Jr., graduate student, Emporia, Kans.

#502—"Comparison of Speed Measuring Devices for Traffic Law Enforcement"—The Traffic Institute, Northwestern University, Evanston, Illinois—J. Stannard Baker, director of Research.

#601—"Public Attitude Toward Unsafe Driving Practices"—Michigan State University, East Lansing, Mich.—Abram M. Barch, assistant professor, Psychology and Highway Traffic Safety Center

#610.1—"A Study of Selection and/or Construction of Valid Educational Principles and Their Application to Guide the Teaching of Driver Education for Achievement of Desirable Attitudes—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research (Ed.D) by Arthur L. Mahoney, Bureau of Traffic Safety, New Jersey

#610.1—"The Use of Group Discussion—Decision Method in USAF Traffic Safety Education"—United States Air Force, Air Research and Development Command, Air Force Personnel and Training Research Center, Randolph Air Force Base, Texas—Willis H. Wood, Lt. Col., USAF

#610.1—"Research Needs in Traffic Safety Education"—National Commission on Safety Education of the National Education Association, 1201 Sixteenth St., N. W., Washington 6, D. C.—S. A. Abercombie

#610.3—"Analysis of Driver Improvement Activities"—Michigan State University, East Lansing, Mich.—Milo W. Chalfant, lecturer, School of Police Administration and Highway Traffic Safety Center

#611.2—"An Evaluation of the Driver Education Program of the Vermont School System"—Center for

Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research, (Ed.D.) Robert Chutter, Colonel, United States Army (Ret.), Pittsford, Vt.

#611.2—"An Evaluation of the Teaching Effectiveness of the Multiple Car Plan"—Michigan State University, East Lansing, Mich.—Robert O. Nolan, M.Ed., Highway Traffic Safety Center

#611.2—"Effectiveness of Driver Education in Accident Prevention"—South Carolina State Highway Department, Columbia, S. C.—Jesse A. Rutledge, director, Public Relations and Safety Education

#611.2—"Comparative Results of Driver Education Versus Driver Education Plus Driver Training Programs in the Los Angeles City Schools"—Delinquency Control Institute, School of Public Administration, University of Southern California—Dan G. Pursuit, director, Delinquency Control Institute

#611.3—"Development of a Workbook for Classroom Instruction in Driver Education"—Center for Safety Education, New York University, 6 Washington Square, North, New York, N. Y.—Doctoral Research (Ed. D.) Frank Bennett, supervisor of Safety Education, Baltimore, Md. Degree awarded June, 1956.

#611.3—"Recommended Practices and Procedures for Use in the Improvement of Programs for the Selection and Education of School Bus Drivers"—Center for Safety Education, New York University, 6 Washington Square, New York, N. Y.—Doctoral Research (Ed.D.) by Ronald D. Patterson, supervisor, Safety Education Department, Detroit Public Schools, Detroit, Mich.

#611.3—"Human Abilities and Control Systems"—University of Rochester, Rochester, N. Y.—Dr. S. D. S. Spragg

#611.3—"Comprehensive Study of Driver Education in High Schools with View to Recommending to Legislature"—Highway Lifesavers Committee of Oregon Citizens, Inc., 607 U. S. National Bank Bldg., 6th & Oak Sts., Portland 4, Ore.—Walter W. R. May, assistant secretary

#611.3—"Average Percentile Rating of Over-The Road Driver Personnel"—Mid-States Freight Lines, Inc., 5200 S. Pulaski Rd., Chicago 32, Ill.—A. F. Mayerhofer

#611.3—"Effectiveness of the Auto Trainer"—American Automobile Association, Washington, D. C.—Earl Allgaier

#614.2—"Status of Safety in Communities under 10,000 Population"—Kiwanis International, 520 N. Michigan Ave., Chicago 11, Ill.—L. A. Hapgood, director of activities in cooperation with the Safety Council and the National Citizens Committee.

#614.3—"Average Merit Level for Over-The-Road Personnel"—Mid-States Freight Lines, Inc., 5200 S. Pulaski Rd., Chicago 32, Ill.—A. F. Mayerhofer

#614.4—"Interrelationships of Teenage Road-e-o Scores"—American Automobile Association, Washington, D. C.—Sam Yaksich, Earl Allgaier

#630—"Traffic Engineering In-Service Training"—National Committee on In-Service Traffic Engineering Training—Chairman: Dr. Donald S. Berry, Purdue University, Secretary; C. C. Robinson, Automotive Safety Foundation, Washington, D. C.

#722—"An Investigation of Vehicular Speed Regulations"—Illinois Highway Research Council—A Cooperative project with the following agencies participating—Illinois Division of Highways—University of Illinois—College of Engineering, Federal Bureau of Public Roads

#951—"Impact of Highways on Patterns of Land Use and Land Values"—Michigan State University, East Lansing, Mich.—Arthur E. Warner, D.B.A., assistant professor, Business Administration (assigned to Highway Traffic Safety Center for this research)

#970—"Urban Transportation Planning"—National Committee on Urban Transportation, Room 323 Du Pont Circle Bldg., 1346 Connecticut Ave., Washington 6, D. C.—William A. Rusch, staff director

RESEARCH NEEDED

From Page 2

Another parallel can be found in the field of public health. Years ago, little was known about the causes of disease and the public was indifferent about sanitation. Continuing research, not only on the causes of disease but also on prevention techniques carried on in the universities and medical institutions of the country, has now reversed the situation. The public will not permit unsanitary conditions as a result of the educational impact of the facts obtained by this scientific research.

In the same way sufficiently large scale, continuing research on human and physical factors underlying accidents and congestion can result in improved driving knowledge and better driving conditions.

The continuing improvement of techniques in education, enforcement and traffic engineering is essential. These methods have brought gains as evidenced by the decrease in fatalities in relation to the total miles driven.

To increase this rate of achievement, however—to effect the major breakthrough, new methods and information are needed. Research must find a way to get ahead of the problem. Basic and applied research has done this in industry, in medicine, in the atomic sciences, in aviation and other fields.

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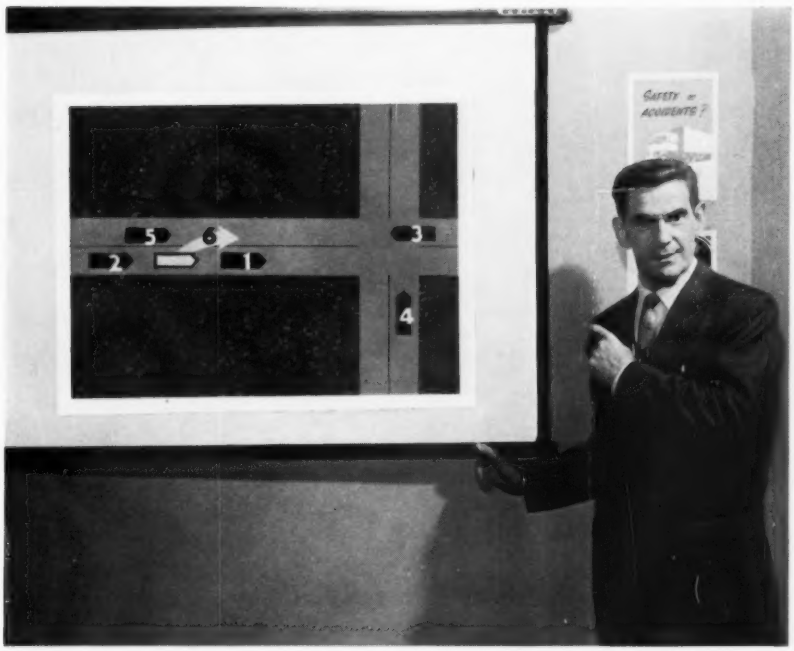

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